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THE

# RETROSPECT

OF

# PRACTICAL MEDICINE & SURGERY,

BEING

## A Half-Yearly Journal,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

Edited by

W. BRAITHWAITE,

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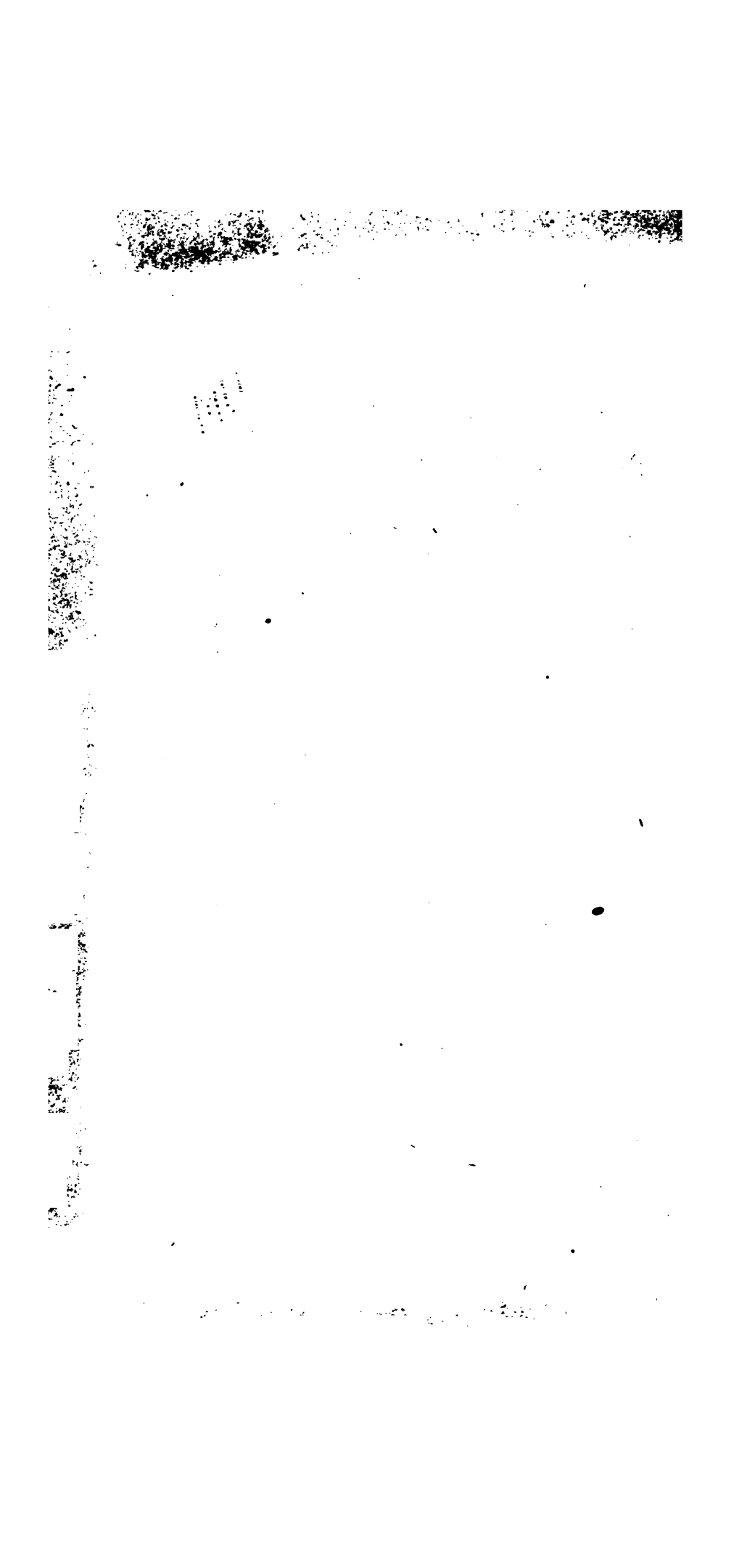

Medical

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SYNOPSIS.—INDEX.

# PRACTICAL MEDICINE.

&c., &c.

## DISEASES AFFECTING THE SYSTEM GENERALLY.

### ART. 1.—LEUCOCYTHEMIA, OR BLOOD CONTAINING AN UNUSUAL QUANTITY OF COLOURLESS CORPUSCLES.

By Dr. JOHN HUGHES BENNETT, F.R.S E., Professor of the Theory of Physic and of Clinical Medicine in the University of Edinburgh.

[Leucocythemia is a disease to which we find but little or no reference in medical works, but, like all other blood diseases, may be more common than we have hitherto suspected. Prof. Bennett has given us some most interesting information on the subject.

The term Leucocythemia is derived from the Greek words λευκὸς, white; κυτος, cell; and αἷμα, the blood—literally, *white cell blood*, expressing the simple fact, or a pathological state, and involving no theory. The first case of this disease, mentioned by Dr. Bennett, is one discovered after death, with hypertrophy of the spleen, liver, and lymphatic glands. It occurred in a patient admitted under Dr. Christison on the 27th of February, 1845. He was of dark complexion, usually healthy and temperate. In June, in the previous year, he noticed a tumour in the left side of the abdomen, which increased in size until four months before, when it became stationary. He had not had indigestion or vomiting since he noticed the tumour. On his admission there was a large tumour, extending from the ribs to the groin, and from the spinal column to the umbilicus, lying on the left side. Ordered to have two pills of iodide of iron, morning and evening. On March 1st his urine was of sp. gr. 1013, and the sediment presented cubic crystals under the microscope, it disappeared almost entirely on the addition of liq. potassæ, but was unaffected by nitric acid. He lingered until March the 15th, when he died suddenly in the morning. The following is the condition in which the blood was found at the post mortem examination.]

*Blood.*—The blood throughout the body was much changed. In the right cavities of the heart, pulmonary artery, venæ cavæ, vena azygos, external and internal iliac veins, and many of the smaller veins leading into them, it was firmly coagulated, and formed a mould of their size and form internally. In the cavities of the heart and venæ cavæ, the blood, when removed, was seen to have separated into a red or inferior, and a yellow or superior, portion. The red portion was of a brick-red colour; it did not present the dark purple smooth and glossy appearance of a healthy coagulum, but was dull and somewhat granular on section, and when squeezed readily broke down into a grumous pulp. The yellow portion was of a light yellow colour, opaque and dull, in no way resembling the gelatinous appearance of a healthy decolorised clot. When squeezed out of the veins, as was sometimes accidentally done where they were divided, it resembled thick creamy pus. In some portions of the veins, the clot was wholly formed of red coagulum. In others it was divided into red and yellow. In a few places the yellow formed only a streak or superficial layer upon the red, or covered the latter with spots of various sizes. Whether this coagulum existed in all the veins could only have been ascertained by a complete dissection of the body. It was seen, however, that the femoral veins, after passing under Poupart's ligament, were empty and perfectly healthy as far down as the Sartorious muscle. The external and internal iliac veins, as well as the pelvic veins, were full and distended. The azygos, both axillary and jugular veins, were full, also the longitudinal, the lateral, and other sinuses at the base of the cranium, and veins ramifying on the surface of the brain. In this last situation some of the veins appeared as if full of pus, whilst others

were gorged with a dark coagulum. In the aorta and external arteries were a few small clots, resembling those found in the veins. These vessels, however, were comparatively empty. The basilar artery at the base of the brain was distended with a yellow clot.

*Vessels.*—The arteries and veins themselves were perfectly healthy. Although carefully looked for, in no place could thickening or increased vascularity be observed. Nowhere was the clot adherent to the vessels, but, on the contrary, it readily slipt out when an accidental puncture was made in them.

*Microscopic Examination.*—The yellow coagulum of the blood was composed of coagulated fibrin in filaments, intermixed with numerous colourless corpuscles, which could be readily squeezed out from it when pressed between glasses. When the yellow coagulum was unusually soft, the corpuscles were more numerous, and the fibrin was broken down into a diffluent mass, partly molecular and granular, partly composed of the debris of the filaments broken into pieces of various lengths. The corpuscles varied in size from the 1-80th to the 1-120th of a mill. in diameter; they were round, their cell-wall granular, and presented all the appearance of pus corpuscles. Water caused them to swell and lose their granular appearance, and acetic acid dissolved the cell-wall and caused a distinct nucleus to appear. This nucleus was composed sometimes of one large granule about the 1-200th of a mill. in diameter, at others of two or three smaller granules, as is seen in corpuscles of laudable purulent matter. The red portion of the coagulum contained a smaller number of these colourless corpuscles, mixed with a multitude of normal yellow corpuscles. The colourless corpuscles now described were found in the blood throughout the system. They were seen in the veins and arteries ramifying on the brain, in the coronary veins, hemorrhoidal tumours, and wherever the blood was examined. On stripping off a portion of the pia mater, and examining the capillary vessels of that membrane, all that were not too minute to contain them were found crowded with the same corpuscles. This fact was confirmed by Dr. Allen Thomson, to whom I sent a portion of the brain for that purpose.

[The second case was one occurring in a farm-servant, admitted on the 25th of January, 1850. Had enjoyed good health until twenty months since, when he noticed a swelling in the abdomen, accompanied by some pain. During three months last summer he had lived in the fenny districts of Lincolnshire, but never had intermittent fever. On examining the abdomen a hard tumour could be felt occupying the whole of the left side of the abdomen, emerging from the false ribs on the left side of the ensiform cartilage, to about an inch and a half above the symphysis pubis. The liver was found to be of the natural size. There was profuse diarrhœa, the bowels being open eight or ten times a-day; this symptom had existed for three or four weeks.]

The appearance of the blood drawn from the extremity of the finger, when magnified 250 diameters linear, is represented in Fig. 1. The coloured corpuscles for the most part have collected together in rolls, the numerous colourless corpuscles filling up the intervening space. Acetic acid dissolved the coloured bodies, and rendered the cell-wall of the colourless ones very transparent—bringing into view the nucleus, consisting of a single round or oval body in some, but in the majority presenting two, three, or even four granules, each having a depression in its centre. Here and there the nucleus was crescentic, or in the form of a horse-shoe. (Fig. 2.)

**Fig. 1.**

Fig. 2. Fig. 3.

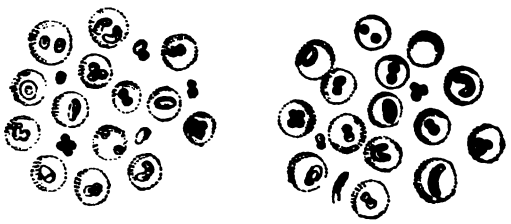

Fig. 1.—Appearance of a drop of blood, magnified 250 dia. taken from Tinlay's finger.
Fig. 2.—The same after the addition of acetic acid.
Fig. 3.—A drop of blood, treated with acetic acid 24 hours after being taken from the arm by venesection.

[On the 7th of August his health was improved, all the ascites had nearly disappeared. The tumour measured transversely thirteen and a half inches, and longitudinally fifteen inches. The circumference of the abdomen at the widest part thirty-four inches.]

This boy was in the Infirmary upwards of six months, and the symptoms and entire progress of the case were watched with the greatest care. Unlike the former case, *the spleen was the only organ enlarged*, the liver presenting its normal dulness on percussion. The abdomen, however, was also the seat of ascitic distension. The smallest drop of blood taken from the boy's finger exhibited, during the whole of his residence in the Infirmary, the excess of colourless corpuscles, and the number of these underwent no perceptible increase or diminution, notwithstanding the varieties of treatment to which he was subjected. Owing to the theories which have been from time to time advanced regarding the functions of the two kinds of corpuscles found in the blood, and of the nature of its colouring matter, iron was the drug which seemed indicated. This boy had also lived in the fenny districts of Lincolnshire; and, although he denied ever having been affected with intermittent fever, it seemed very probable that the enlargement of the spleen was owing to this cause. I commenced the treatment, therefore, with the exhibition of iron and quinine. Other symptoms, however, became so urgent as to demand special attention, and the suspension of these remedies. I allude to the diarrhœa and dyspnœa, the former of which constituted the leading symptom of the disorder during the entire period he remained in the house. All kinds of astringents were given, with occasional temporary, but never with permanent advantage. At one period he was so exhausted that I expected his death daily for a period of some weeks. He, however, again gained strength; and his bodily powers, except towards the termination of his residence in the house, were subject to considerable variations, evidently dependent on the amount of diarrhœa.

[The fibrin in this case, was increased to double its amount in healthy blood. The albumen and salts were in normal proportion. The globules were diminished to one-half their proper amount, and the deficiency was counterbalanced by an increase in the amount of water.

In the third case of this disease, which was detected both during life and after death, admitted on the 18th of July, 1850, there were symptoms of bronchitis on auscultation. Heart's sounds natural. Great enlargement both of liver and spleen, indicated by palpitation and percussion. On the microscopical examination of the blood after death, it was found much the same as in the previous cases. The cells of the liver varied considerably in size, and some of them contained fatty granules scattered through them.]

This case, while almost identical with the first, in regard to the morbid condition of the blood, spleen, and liver, and the existence of febrile action, differs from it in several remarkable particulars. There was no tendency to diarrhœa. It is expressly stated that she was generally costive. On the other hand, there was an hemorrhagic tendency,—the skin and same serous surfaces being thickly sprinkled with spots of purpura, in addition to hæmoptysis and

spongy bleeding gums. In connection with these symptoms, we should remark, that the blood was observed to be unusually fluid after death, and that its analysis by Dr. Robertson during life showed that, while the corpuscles were greatly diminished in amount, and the water correspondingly increased, the fibrin had undergone nò change in quantity, or if anything was slightly under the average. The excess of colourless corpuscles, therefore is not necessarily connected with an increase in the amount of fibrin, although here, as in Case II., a remarkable diminution in the aggregate quantity of globules, both white and coloured, existed.—*Monthly Journal of Med. Science, Jan.* 1851, *p.* 17.

## 2.—DIFFERENT FORMS OF FEVER.

By Dr. WILLIAM JENNER, Prof. of Pathology in University College.

[In Retrospect, Part XIX., we gave some interesting views of Dr. Jenner on typhus and typhoid fevers. The following remarks, although in many points identical with those already published, contain matter which we did not previously lay before our readers.]

Dr. Jenner strongly maintains that typhoid and typhus fever are diseases which have a totally different origin, and are developed in a different manner; and he considers that they are quite as distinct as measles is from scarlatina. The chief anatomical difference consists of the presence of disease of Peyer's patches in typhoid fever, and its absence in typhus; and it was accordingly found, that while in the former fever these patches were already diseased, in every one of the forty-three cases of typhus fever there was no recent disease whatever.

The diagnosis of these affections during life may be satisfactorily made by an observation of the concomitant eruption. In typhoid fever, it consists of a number of rose spots, of a papular character, slightly elevated, never acuminated at the apex, never flat, but invariably rounded, of a bright rose colour, gradually fading away into the natural hue of the skin, and disappearing completely upon pressure. The eruption accompanying typhus fever, is called a mulberry rash by Dr. Jenner; this eruption is never papular, and consists of very slightly elevated spots, of a dusky pink colour. Instead of disappearing in two or three days, like the rose spots of typhoid fever, the mulberry rash soon undergoes a remarkable change; the spots become of a darker and more dingy colour, and they only fade on pressure: and after exhibiting these characters, they disappear in some cases. In others, however, they reach a third stage, and the spots change into true petechiæ, *i. e.*, spots presenting the following characters: a dusky crimson or purple colour, quite unaffected by pressure, a well-defined margin, and a total absence of elevation above the level of the cuticle. The usual situation of these spots is on the trunk and extremities, but occasionally they are limited to the trunk, and now and then they are observed on the face.

The *tongue* is stated by Dr Jenner to have exhibited a remarkably different appearance in typhoid and typhus fever. It was much more frequently moist throughout the disease in typhoid, than in typhus fever. When dry, it was often red, glazed, and fissured, in the former; but it rarely exhibited these characters in the latter. In typhoid fever, when the tongue was brown, its hue was of a yellowish-brown, instead of a blackish-brown. "The small dry tongue, with red tip and edges, smooth, with pale brownish-yellow fur, fissured, the surface seen between the fissures, being deep red, may be considered differently, as a diagnostic sign of typhoid fever."

In his treatise on the *Identity or Non-Identity of the Specific Cause of Typhoid, Typhus, and Relapsing Fever*, Dr. Jenner draws an analogy between these diseases and small-pox, scarlatina, and measles; and he maintains, that just as the three last diseases, while presenting certain characters in common, are nevertheless essentially distinct in their specific causes, so the three fevers are characterised by differences equally well marked. The rose spots observed during life, and the presence of disease in Peyer's patches soon after death, are peculiar to, and absolutely diagnostic of, typhoid fever: the mulberry rash, often passing into true petechiæ, and the absence of disease in the agminated

glands, are characteristic of typhus; while the relapsing fever is distinguished by the recurrence of the symptoms after apparent convalescence.

In answer to the view which has been taken, that typhoid and typhus fever are merely modifications of the same disease, induced by variations of the epidemic constitution, Dr. Jenner maintains that his experience is in direct opposition to such a statement. "I may remark," he says, "that during three years' attentive watching of nearly all the cases admitted into the London fever hospital, in which time there have been epidemics of relapsing fever, typhus fever, and cholera, and, consequently, according to those whose opinions I am here examining, as many changes in epidemic constitution, I have seen no alterations in the general or particular symptoms of either typhus or typhoid fevers, or the lesions observed after death from either, *i. e.*, from November, 1846, to November, 1849. The cases of typhoid fever, which disease is rarely absent for a fortnight from the wards of the hospital, preserved their symptoms unchanged, and presented the same lesions, whatever the epidemic constitution that prevailed: the same is true of typhus fever. Cases of the latter disease are also rarely absent from the wards of the same institution."—*London Journal of Medicine, January*, 1851, *p.* 64.

[In a letter to the Editor of the 'London Journal of Medicine,' Dr. Jenner further says:]

So far as I am aware, during four years' daily attendance at the London Fever Hospital, I saw not a single exception to the rule, that rose spots are diagnostic of typhoid fever, that is to say, of an affection having for its anatomical character disease of Peyer's patches, and that the mulberry rash is diagnostic of typhus fever; I mean just as far diagnostic of those diseases as are the eruptions of measles, and of scarlet fever diagnostic of those two diseases. I may add, that the experience of 1850 fully bore out the law I attempted to establish in vol. xxxiii. of the 'Medico-Chirurgical Transactions,' that the poison of typhoid fever, of typhus, and of relapsing fever, respectively produce only disease identical in essential characters with that from which the poison generating the new disease itself sprung.—*London Journal of Medicine, March*, 1851, *p.* 288.

*Relapsing Fever.*—[We would recommend our younger readers to pay particular attention to the symptoms and course of what Dr. Jenner calls *relapsing fever*, as their knowledge of this disease may save them some unpleasant *scrapes*, into which they may fall, especially when practising in the higher class of patients. Let them bear in mind that in about three weeks from the first attack or about seven days from the *first* convalescence, the patient will probably relapse.]

Relapsing fever affects persons of all ages. The patient, previously in health, is seized, on waking in the morning, or it may be while occupied about his daily avocations, with rigors, sometimes severe, sense of chilliness, and headache, usually frontal. These are followed by heat of skin; and this, again, is frequently succeeded by sweating; the sweating, however, when it occurs, appears to afford relief. There is soon pain in the back and limbs, frequent pulse, and a dry and hot skin. The tongue is now white, the urine high colored, the appetite is lost, and there is considerable thirst. The patient passes sleepless nights. Vomiting of green bile is generally one of the earliest symptoms. The rigors, headache, vomiting, and pain in the back, might lead one to suppose the patient to be laboring under small-pox; but the pain in the back is rarely so severe, nor is the vomiting so incessant as it ordinarily is in the early period of the last-named disease. The headache is seldom so violent as it is in common "bilious headache," in which latter, moreover, it is commonly occipital; the heat of skin and the quick pulse serve still further to separate relapsing fever, at its outset, from that troublesome affection. The suddenness of the attack, the rigors, hot skin, pain in the limbs, and white tongue, distinguish relapsing fever from idiopathic head affections. The patient is generally obliged at once to take to his bed. He feels not exactly too weak, but too ill to keep about; frequently affirms only that he is too giddy to walk; *i. e.*, vertigo, and not sense of weakness, drives the patient to bed. The sudden transition from health to a sense of disease warns him that some severe illness is setting in.

By the second or third day, the heart often beats 100, 120, or even 130 strokes in the minute; the patient gets no sleep; and even by the fifth or sixth day, may be violently delirious. The bowels are usually somewhat confined at the commencement.

After a period varying from five to ten days, a profuse perspiration breaks out, and in the course of a few hours the patient appears nearly well. The alteration is most remarkable: in the morning the pulse may have been 120 in the minute, the skin hot and dry, the head throbbing; in the afternoon the pulse is 60, the skin cool, the head free from pain.

On the following day the patient is apparently, in every respect, free from ailment. His appetite returns, his strength improves, and we suppose him progressing favorably; when, on from the 12th day to the 20th, reckoning from the outset of the illness, or on *about* the 7th, counting from the crisis, the patient having committed no hygienic error, the preceding day having been seemingly in health, or simply weak, is again suddenly seized with rigors, vomiting of green fluid, and headache, quickly followed by hot skin, quick pulse, furred tongue, loss of appetite, and confined bowels; delirium, perhaps, supervenes, and, in fact, he is in the same state as on the day his illness commenced. The pulse, which falls remarkably during the period of apparent convalescence, often beating, the day preceding the relapse, as infrequently as 48 strokes in the minute, rises suddenly to 120, or even higher. After the expiration of two, three, four, or five days, the patient is again bathed in perspiration, and the next day is convalescent.

Such is the ordinary course of a tolerably severe non-fatal case of relapsing fever. But in some cases it presents certain deviations from this, which may be regarded as its normal type. Instead of commencing abruptly, it may make its attack insidiously; *epistaxis* may be among the earliest symptoms, the crisis may be blended by diarrhœa, or loss of blood from the nose, and it is said, but I have never seen such a case, by discharge of blood from the bowels, instead of, as is far more common, by sweating. In women, the catamenial discharge appears, in some cases to be critical.

The relapse may be very imperfectly marked; a slight, *even now and then only comparative*, increase in the rapidity of the pulse, and a little greater heat of skin than was observed on the previous day, being all that indicates its supervention. If blood be drawn during the primary attack or the relapse, it is in many cases more or less buffed, and that without co-existence, so far as can be ascertained, of any local inflammation.

Yellowness of the skin is by no means an uncommon symptom.* The jaundice is sometimes intense; it may be present during the first attack, disappear before the relapse, and not recur; or it may occur only in the relapse. When jaundice supervenes, *the stools retain their natural hue, or are darker than common;* at the same time the urine is frequently loaded with bile.

The skin sometimes has a purplish mottled aspect, an exaggerated resemblance to the skin of young children. Petechiæ are now and then present—flea-bites, which often exist in immense numbers on the trunk and extremities of the poor, have frequently been confounded with them; at the same time the large size in rare cases of the subcuticular effusions of blood, and the fact noticed by some physicians, that they have made their appearance after the patient entered the hospital, prove that they are due in certain cases to a change in the solids and fluids of the body, and not to the bites of insects.

*Neither the mulberry rash of typhus fever nor the rose spots of typhoid fever are ever present in relapsing fever.*

Sudden sinking marks the progress of some cases; it is indicated by a deep dusky hue of the face, lividity of the hands and feet, a purple marbling of the whole surface. The trunk feels cool, the hands and feet cold—the patient is in a state of collapse, without having suffered from any severe pain, or exhausting discharge. In such cases he is unable to be aroused, to exhibit any

* Jaundice is a *very* rare symptom in typhus and typhoid fevers, so rare that I cannot call to mind a single case in which I have observed it, while it is more or less marked in nearly a fourth of the cases of relapsing fever.

sign of consciousness; and not unfrequently dies in a few hours—generally from twelve to twenty-four—after the physician had supposed him to be free from danger. Death is, however, a rare termination of relapsing fever; when it does occur, the fatal event may take place during the primary fever or the relapse—I think the former has been in my experience more commonly the case.

*Pain in the limbs of a very severe character* is not unfrequent at the outset of the disease, but it has been noticed by several writers, and my own observations are in accordance with their experience, that severe muscular pains sometimes cause considerable suffering after the termination of the primary attack, and also after the relapse, *i. e.*, after the patient is, in all other particulars, in health.

More or less violent delirium is now and then observed, as Dr. Robertson pointed out, after the critical discharge has taken place.

Vomiting, as I have said, is a frequent symptom in both the first and second attack. The fluid ejected is ordinarily bright grass green, and very large in quantity. Sometimes the vomiting is almost incessant, and continues during the whole course of the disease. Tenderness at the epigastrium is a common symptom in all cases, but it is especially marked in those to which I have just referred.

If pregnant women are attacked by relapsing fever, a very large majority, if not all, abort. Death sometimes, but by no means invariably, happens under such circumstances.

A second relapse occurs in a few cases; the patient convalescent about the 7th day, relapses about the 14th; is a second time convalescent by from the 17th to the 21st day; and relapses again from the 21st to the 25th days, for convalescence to be finally established from the 25th to the 28th days. However, in some cases, the disease terminates at the end of a week, the patient experiencing no relapse.

The most frequent local complication, next to enlargement of the liver and spleen, is inflammation of the lung. I have never seen in relapsing fever, any more than I have in typhus fever, an example of meningeal or cerebral inflammation.

Death from uncomplicated relapsing fever is rare. No anatomical character of this disease has been pointed out. The most constant lesion by far is enlargement of the spleen. The size attained by that organ is, I think, on the whole, larger than in either typhus or typhoid fevers. I have found it weigh as much in one case as 38 oz., its size being in proportion to its weight. Pale yellowish pink masses of variable size, firm to the touch, but friable, with a slightly granular fracture, are occasionally found in the substance, and near the surface of this organ. As a rule, there is but little congestion of the lungs, the weights of which contrast singularly with the weights of the same organs in subjects dead from typhus fever. The brain and its membranes, also are remarkably free from appreciable lesion. A slight excess of serosity beneath the arachnoid and in the lateral ventricles is, however, occasionally observed. The blood, in a few cases, has been found fluid throughout the body. The heart offers no appreciable deviation from its normal condition. The liver is generally large, and the gall-bladder contains a considerable quantity of thick dark bile; the ductus communis allows bile to pass freely into the duodenum even in those cases where jaundice was present at the time of death.

The gastro-intestinal, the larygo-bronchial, and genito-urinary mucous membranes, present all the characters of health. The kidneys are normal. This description applies only to uncomplicated cases; for, should any local inflammation have been set up during life, the charactrs of that lesion will, of course, be present after death; thus consolidation of the lung and the signs of recent pleuritis are sometimes detected.—*Med. Times, Dec.* 21, 1850. *p.* 646.

[Dr. Jenner describes another form of fever, which he terms *Fabricula*. Its attack is comparatively mild and short. It may be called, perhaps, a *bad cold*: its cause is not specific.]

These four different kinds of fevers, viz.; typhus, typhoid, relapsing and fabricula, have frequently been confounded together by the term *continued*

*fever*. It will be very convenient to separate these fevers in our classification and description, and much more satisfactory both in prognosis and diagnosis. They are probably as distinct diseases as measles, scarlet fever, and small pox. Dr. Jenner sums up his views in the following synopsis.]

The four diseases thus attempted to be separated from each other may be briefly thus defined :—

*Fabricula*.—A disease attended by chilliness, alternating with sense of heat, headache, white tongue, confined bowels, high colored scanty urine, hot and dry skin, and frequent pulse, terminating in from two to seven days, and having for its cause excess, exposure, over fatigue, &c., *i. e.*, the cause of fabricula is not specific.

*Relapsing Fever*.—A disease arising from a specific cause, attended by rigors and chilliness, headache, vomiting, white tongue, epigastric tenderness, confined bowels, enlarged liver and spleen, high colored urine, frequent pulse, hot skin, and occasionally by jaundice, and terminating in apparent convalescence in from five to eight days—in a week a relapse, *i. e.*, a repetition of the symptoms present during the primary attack.

After death spleen and liver are found considerably enlarged, absence of marked congestion of internal organs.

*Typhoid Fever*.—A disease arising from a specific cause, attended by rigors, chilliness, headache, successive crops of rose spots, frequent pulse, sonorous râle, diarrhœa, fulness, resonance, and tenderness of the abdomen, gurgling in the right iliac fossa, increased splenic dulness, delirium, dry and brown tongue, and prostration, and terminating by the thirtieth day. After death. Enlargement of the mesenteric gland, disease of Peyer's patches, enlargement of the spleen, disseminated ulcerations, disseminated inflammations.

*Typhus Fever*.—A disease arising from a specific cause, attended by rigors, chilliness, headache, mulberry rash, frequent pulse, delirium, dry brown tongue, and prostration, and terminating by the twenty-first day. After death.—Disseminated and extreme congestions; in young persons, enlargement of the spleen.

I do not mean to say that in every case of either of these diseases all the symptoms here enumerated will be present, or that, in many cases, other symptoms will not be superadded; but I give the above as the ordinary diagnostic characters of the diseases,—symptoms which, if present, leave no doubt on the mind of the observer of the name of the disease. Just as, if chilliness, succeeded by heat of skin and running from the eyes and nose, and harsh cough, should be followed, on the fourth day, by an eruption of port-wine red spots, arranging themselves more or less crescentically, and then the whole of these symptoms should disappear on from the seventh to the ninth day of disease, no one would entertain a doubt that the patient was laboring under measles; and that, although measles may affect a person, and yet some of the above symptoms be absent; or although, in particular cases, additional symptoms may be present. I intend, then, the foregoing brief descriptions of febricula, relapsing fever, typhoid fever, and typhus fever, to apply to those diseases as much as, but no more than, the above description applies to measles.

As my object was simply to illustrate the different continued fevers of the country, it is only with reference to here and there a point; *e. g.*, the frequency with which the mulberry rash is absent from individuals of different ages affected with typhus fever, that I have attempted to prove any of the statements I have made with reference to the frequency with which particular symptoms or lesions are present or absent, the invariable connexion between certain symptoms and certain changes of structure, &c., &c. At the same time, in some instances, the cases adduced prove the fact they illustrate; the case is at once the illustration and the proof.

At the outset I stated that I should touch but slightly on the question of treatment. This was not from my undervaluing the usefulness of therapeutical agents in some of the diseases here illustrated, but rather because that I felt so much had been written on the treatment of fever,—so often had it been argued *post hoc propter hoc*,—so greatly had some erred, it appeared to me, in substituting general impressions of the efficacy of drugs for rigid logical induction, that I

determined to make few therapeutical assertions unsupported by that weight of argument in the shape of facts I knew I had it in my power to adduce in evidence; to arrange and to analyse those facts is a work of time, and the pages of a journal are unsuited for their publication. Such are the arguments that have influenced me in postponing the consideration of treatment—a subject so easy to write on, so difficult to discuss philosophically. But this much I hope the reader will have gathered from these papers; that henceforth, whether the therapeutist speak dogmatically in the loose and easy phraseology of general terms, or, having worked out his results by rigid induction, he lay before his reader the process by which he arrived at his conclusion, as well as the conclusion itself.—I say, whether he intends to load the literature of fever with another *ipse dixit*, or to add a truth to those which have been dug out by constant toil,—whichever be his purpose, he must distinguish from each other diseases having a different origin, a different course, different symptoms, and leading to or accompanied by different lesions, and not confound all under one common name because they possess in certain cases, as common symptoms, a brown tongue, frequent pulse, and loss of general power.—*Med. Times, March* 22, 1851, *p.* 314.

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## 3.—REMARKS ON CONTINUED FEVER, AND MORE ESPECIALLY ON THE CONDITION OF THE BRAIN IN FEVER.

By Dr. HUMPHREY SANDWITH, Physician to the Hull Infirmary.

[The correctness of the opinions of Dr. Jenner are, in some particulars, questioned by Dr. Sandwith, of Hull. Louis was the first to appropriate the term typhoid fever to the morbid state which accompanies the lesion of Peyer's glands. And though Andral objected to this, nevertheless, it has been proved by Dr. Jenner, that a rose-colored rash on the skin is characteristic of typhoid fever, while mulberry spots are equally distinctive of typhus. This last disease is said never to be accompanied by the peculiar enteric lesion marking the former. Dr. Bartlett asserts that there is as much difference between typhus and typhoid fever as there is between measles and scarletina, an opinion with which Dr. Sandwith does not concur. He says:]

Both are forms of adynamic fever—mere varieties—exhibiting different phenomena under different circumstances, the follicular abdominal lesion generally present in France and America, whilst in England it is comparatively much rarer. "At certain times and places," says Dr. Watson (in other words, in certain epidemics), "the ulceration of the inner surface of the intestines is far less common than in others. It was comparatively rare in an epidemic, of which I witnessed some part in Edinburgh. Then I came to London; and for several years I never saw a body opened after death by continued fever, without finding ulcers in the bowels. More recently, however, and especially during the present epidemic (1838), I have looked for them carefully in many instances that have proved fatal in the Middlesex Hospital, and have discovered neither ulceration, nor any other apparent change in the follicles of the intestines." As additional proof that typhoid and typhus fevers are simply varieties of the same essential disease, of which the *typhoid* form prevails chiefly on the continent and in America, and *typhus* chiefly, though by no means exclusively, in England, it has been observed that on the examination of those who have died of ship-fever, which is an adynamic petechial typhus, the follicular lesion is generally absent, *and yet exceptional cases of its presence now and then occur*. On the other hand, Dr. William Jenner himself admits, that, occasionally, though very rarely, in typhoid fever with the rose rash, the follicular lesion is wanting. Again, M. De Claubry has proved in a prize essay on the 'Identity of Typhus and Typhoid Fever,' to the satisfaction of MM. Chomel and Louis themselves, that the typhoid fever of M. Louis is the same as the typhus of armies, and equally contagious.

Professor Rokitansky, of Vienna, has developed a still more novel view of the nature of the typhoid affection or "typhus," as he calls it. His view is that it is a true dyscrasy, or cachexia, and that the pathological process is characterised by the deposition of a peculiar morbid product, which forthwith undergoes

a distinct series of morbid changes. "The seat of this process is various, and depends upon the specific relation of the poison of typhus to certain organs. The tissues most subject to this deposition are *the mucous membranes, especially the space between the mucous and the muscular coat, and the mesenteric glands*; and in Austria, at least, where the observations were made, *the mucous membrane of the ileum* is most frequently affected; but it occurs also *in the bronchia and lungs*, and, although very rarely, *in the colon*. This typhus deposit, according to M. Vogel, usually appears in a less firm lardaceous mass, of a yellowish or whitish colour, which is deposited in greater or less abundance amongst the normal tissues, gradually softens, and, as the normal elements of the region become also involved in the process, forms ulcers, which either heal by cicatrization, or continue until the death of the patient. In many cases, however, death takes place before the commencement of the softening. The typhous matter, under the microscope, appears to consist of three elements; an amorphous semi-transparent stroma, very minute molecular granules, and large corpuscles, which seem to be imperfect cells and cytoblasts. Histologically, it cannot be distinguished from the deposits that occur in scrophulosis and tuberculosis." The local importance of this deposit cannot be questioned, as many cases terminate fatally from its effects,—ulceration, perforation of the intestine, &c.

[From the knowledge which we have now acquired, we should rigidly analyze the cerebral symptoms in each case, to endeavour to ascertain whether they are the sympathetic consequences of enteric irritation, or the results of positive organic disease of the nervous centres. We must remember, however, that febrile irritation has often the power to develope constitutional peculiarities of the nervous system, independently of any ascertained local organic lesion.]

We have also to study the prevailing character of epidemic diseases, both as it regards their evident bias to affect one class of organs rather than another, and also as they may assume a low and typhoid, or a high-toned and inflammatory bearing. We must recollect also, that even the same epidemic will undergo a change in its character from the modifying influence of the seasons. "This, however, I am certain of," said the illustrious Sydenham, "from numerous careful observations, that the same method which cures in the middle of the year may possibly prove destructive at the conclusion of it." This observation I have myself verified at St. Bartholomew's hospital. I have seen cases, with a small and depressed pulse, demanding wine to sustain the heart, and simultaneous local cuppings to free an engorged lung, at one period of the year, and other cases in the same epidemic at another season, requiring the withdrawal of the wine, and even the cautious use of the lancet, owing to their assumption of the inflammatory type, with a sharp and resisting pulse. And here I may be allowed to state my decided conviction, that a great change has lately, and especially during the choleraic constitution of the atmosphere, come over the nature of fever, and, in a less degree, over inflammatory diseases in general. This is no new thing. Fifty years ago puerperal fever, according to the united testimony of all the best writers of that period, would not bear bleeding or active purgation. Then followed a change in the seasons, which, according to the experience of Dr. Gordon of Aberdeen, Mr. Hey of Leeds, Dr. Armstrong of Sunderland, Dr. Campbell of Edinburgh, and others, demanded the most heroic depletory measures. I myself witnessed, and put on record, two epidemic maladies, typhus and scarlet fever; the former in 1819, and the latter in 1832; both of which required active depletion, both general and local. Since that period we have witnessed the recurrence of a depressing constitution of the atmosphere, which actually forbids all active lowering measures. On the contrary, so weakened are the vital powers, more especially in fever, that if we use the lancet we almost certainly destroy the patient; while leeches themselves sometimes render recovery difficult, or impossible. In short, a conservative treatment, consisting of the judicious combination of quinine, cordial diaphoretics, diluted wines, and good broths, commenced very early in the course of the disease, promises more success than any other, and seems to sustain the function of nutrition, as well as to obviate those local congestions of the brain, and other organs, which appear to steal on our patients, from the

less of the *vis a tergo* in the heart and arteries. Sydenham, also, bids us attend to the type of contemporary diseases: adding, that the character of a fever "may often be sufficiently known by carefully attending to other diseases." Nor need I remind my readers how much, in ordinary seasons at least, a man's condition, situation, and circumstances, will often modify the complexion of a fever. "A well-fed and previously healthy soldier, who has no cares, will in general have a high-toned fever; whereas a poor, ill-fed, and badly-clothed, laboring man, worn out by cares and anxieties, and living in an ill-ventilated and filthy apartment, will be affected with one of an opposite character."

In other adynamic and malignant forms of fever, we can understand with Dr. Watson how the stupor is occasioned by the poisoned blood, and not by effusion in the brain, and we cannot, therefore, hesitate, in such cases, to administer cordials. In these adynamic forms of fever, Dr. Copland strongly recommends the chlorate of potassa, and Dr. Watson, prescribes a solution of it in water, in the proportion of a drachm to a pint, as a drink. He states, that under the use of a pint, or a pint and a half of this solution daily, he has noticed, in many instances, a speedy improvement of the tongue; which, from being furred or brown and dry, has become cleaner or moist. At the same time, bearing in mind the depressing influences, with which our patients have to struggle, we give stimulants at the proper time, and with a bold hand. The knowledge, again, that the fibrin of the blood is diminished in typhus fever, and that the blood is doubly poisoned by an excess of urea, in addition to the specific miasm, will confirm us in the necessity of sustaining the vital powers, and of avoiding, as much as possible, all lowering agencies.

Now and then, indeed, we meet with cases, in which life is so completely overwhelmed by the depressing miasm, as to hold all our efforts at defiance. For sporadic cases occasionally arise, of so unusually malignant a character as to defy all the resources of medicine. Thus, a few years ago, I was called to a family in Holderness, plunged into great distress from the sudden invasion of the farmer and his wife by what seemed to be a typhus poison; which proved fatal to them both within two days. The wife first fell ill, and was moribund when I saw her, with both her lower extremities cold and livid as high as the knees. Her husband had then, also, been seized a few hours, and was almost pulseless, with petechiæ in various parts of the body, insatiable thirst, parched tongue, and other febrile phenomena. There were neither the symptoms of cholera, nor those of poisoning, nor could they be traced to deleterious vegetable or animal food. Every attempt to sustain the sinking powers, in both these cases, proved wholly nugatory.

Instructed, however, by another class of important facts, we shall not blindly take for granted the absence of cerebral engorgement or arachnitis; but, admonished by the proved occurrence both of stray cases of cerebral lesion in epidemics characterised mainly by disturbance in organs, as well as by the occasional predominance of brain affection in certain epidemics, we shall be on the look out for the possible occurrence of such lesion, and give every case of equivocal aspect the benefit of a most rigid analysis from time to time. M. Rostan's conjecture too is worth considering, who suggests the possibility that inflammation of the brain and its envelopes may be induced by a special cause, as by animal matters in a state of putrefaction. We must note the tone and character both of the epidemic we have to deal with, and of contemporary diseases. We must bear in mind the importance of an early and anticipatory treatment, should cerebral lesion be actually pending. It is remarked by Dr. Graves, in reference to a case of intensely violent maculated fever, which, on account of head symptoms, had been leeched early, and the whole scalp blistered on the *fifth* day, and blistered again as well as the nape on the *eighth* day, that "*on the ninth day* the cerebral symptoms, *which we had been endeavoring to anticipate*, came on, but probably our treatment prevented them from being fatal; for when they appeared, the application of tartar emetic ointment induced a purulent discharge from the whole surface of the twice-blistered scalp, in the course of a few hours, and three grains of tartar emetic, given in divided doses that day, procured a complete cessation of the symptoms, after" —mark, after— "*the pupils had been dilated, and one fit of slight paralysis of the*

*mouth and tongue had taken place.*" It would be foreign to my purpose, and superfluous, to sketch all the symptoms of menaced cerebral lesion; I may notice, however, one on which Dr. Graves lays great stress. "On the morning of the eighth day," he says, in reference to a certain case, "we observed that every now and then he *respired irregularly*, as if repeatedly and gently sighing,"—a variety of respiration often indicating a disturbance of the nervous system, and which I have repeatedly observed as a precursor of cerebral excitement, and to which, consequently, I have been in the habit of drawing the attention of my pupils, under the name of *cerebral respiration.*—*London Journal of Medicine, Feb.*, 1851, *p.* 129.

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## 4—BELLADONNA AS A REMEDY IN SCARLET FEVER.

By Dr. John Gardner.

[Belladonna has been chiefly used as a *prophylactic* where the poison of scarlet fever was likely to be effective. But it has not often been used when the attack has commenced. Some authors have pronounced it decidedly prophylactic, and others, among whom is Dr. Hereira, have doubted this power. It is very justly argued, that twenty cases of failure are more conclusive than hundreds of non-occurrence of the disease after its exhibition. Dr. Gardner supposes that as belladonna was recommended by Dioscordes as a remedy in erysipelas, the analogy of the two diseases must have led many men to employ it in scarlet fever. He says:]

The analogy of scarlet fever in its malignant form with erysipelas, together with our knowledge of the powerful and peculiar influence of belladonna on the nervous system, render it worthy of a full and fair trial. Accordingly, I proceeded to try it, giving it in efficient doses, and taking care that the preparation I administered was in a proper state. The latter precaution is at all times necessary, because, while the extract, if properly prepared and preserved, is highly efficient, it is often found in the shops, either from being badly prepared originally, or from long keeping, wholly inert, so that half an ounce has been given for a dose without any effect. Happily, we have a very excellent and easily applied test for the activity of the extract of belladonna; a grain or two rubbed on the eyelids should, in a minute or two, produce full dilatation of the pupil.

In all my cases up to the present time, I have used extract of belladonna, which was prepared at Apothecaries' Hall, some four or five years old, but it acts immediately on the pupil whether applied externally or taken into the stomach.

Without reckoning slight cases of scarlet fever and sore throat, I have treated upwards of thirty cases with symptoms more or less grave, by means of the belladonna. In very many of these I should formerly have entertained no hope of seeing the patient pass through the attack, the approach of the disease being marked by a malignant aspect. I need not enumerate the peculiar symptoms which characterize fatal scarlet fever—these are well known to every practitioner. In the absence of the belladonna, I have watched with great anxiety these fatal tokens; they allow little room for our anticipations being negatived. But with the belladonna I have not yet met with a fatal case.

Moreover, it is well known, that in no inconsiderable portion of cases; whether severe or slight, very inconvenient sequelæ occur on the subsidence of the fever, arthritic pains, œdema of the extremities, anasarca, and even hydrocephalus. In no case treated with belladonna have I met with such sequelæ.

I administer the belladonna according to the ability of the patient to bear it, in doses of half a grain to a whole grain every three, four, or six hours, dissolved in water; the dilatation of the pupil and the amount of stupor produced, being the basis of discrimination. I do not allow low delirium even from the first, nor indeed any other symptom, to deter me from giving belladonna, but I give no other medicine whatever, except an occasional dose of castor oil to secure a daily action of the bowels.

There is, of course, no objection to the concurrent use of other items of treatment, removal of the hair, cold affusion over the head, and sponging the limbs and body if it can be borne, gargles of the chlorides or mineral acids, &c.; but I depend little on any of these.

The diet I have usually recommended has been bread and milk, never depending upon mere farinaceous foods, so as to withdraw all, or most of the nitrogenous principles from the food, a practice I believe to be fraught with danger.

Making every allowance for the many sources of fallacy necessarily incident to the uses of a remedy under the circumstances of this example, I know nothing in the whole compass of medicine in which I have more confidence. I have recommended this plan of treating scarlet fever to several friends, and their reports of its effects have been uniformly favourable.

It would be out of place here to enter upon speculations as to the *modus operandi* of the belladonna, or any other collateral topic relative to the disease; my present object being simply to state the results of my own experience of the power of belladonna, and to request, on the one hand, any of my readers who may have fallen on the same plan to publish the results they have observed; or on the other, to recommend the trial to those who have not hitherto employed it, without regarding the folly of the homœopathists.

In conclusion, I would suggest that to obviate the uncertainty necessarily attendant upon the use of the extract of belladonna, the alkaloid atropine, or some of its salts, should be tried. The sulphate of atropine is, perhaps the best. It is soluble in water, stable, and in every way manageable. I have not, however, at present prescribed this salt.—*The Institute, Jan.* 4, 1851, *p.* 2.

Mr. T. J. Green, of Peckham, corroborates the communication of Dr. Gardner, as to the value of belladonna in scarlet fever. He observes,—

"The preparation I have used for ten years is the Apothecaries' Hall powder; the colour, aroma, and virtues of this, will, in a dark green bottle, keep for years. The dose I have always given to persons above puberty is one-sixth of a grain in mint water, every four hours. For children I rub one grain with five grains of powder of liquorice root, and of this give one-sixth or one-twelfth of a grain in water, every four hours. For infants it should be used in extremely minute doses, as it sometimes, in my opinion, brings on spasms of the larynx, and kills the child. A gargle of the sulphate of copper, one grain to one ounce of warm water, or camphor mixture, used every hour, is very good."—*The Institute, February*, 1, 1851, *p.* 88.

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## 5.—YEAST IN THE TREATMENT OF MALIGNANT SCARLET FEVER.

[Mr. Bennett, of Gateshead, states that he has found the administration of fresh yeast of the most invaluable advantage when the symptoms are of a malignant character. He says:]

After ammonia, the mineral acids, chlorate of potash, &c., have failed, and the application of nitrate of silver besides, one or two table-spoonfuls of fresh yeast *frequently given* (according to the age and malignancy of the case) has, in my practice at least, been quickly efficacious as an antiseptic and stimulant.—*Medical Gazette, January* 10, 1851, *p.* 84.

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## 6.—DEGENERATIONS OF DIFFERENT PARTS OF THE SYSTEM.

By James Paget, Esq.,—(From a Review of Mr. Paget's Lectures on Inflammation in the British and Foreign Medico-Chirurgical Review.)

The history of the degenerations of lymph constitutes one of the most important parts of the whole pathology of inflammation. As Mr. Paget has justly remarked, degeneration is a part of the regular series of nutritive operations; for, "to degenerate and die, is as normal as to be developed and live; the expansion of growth, and the full strength of manhood, are not more natural than the decay and feebleness of a timely old age,—not more natural, because not more in accordance with constant laws, as observed in ordinary conditions.

"The study of development has always, however, had precedence in the choice

of all the best workers in physiological science, and that of degeneration has been scarcely at all pursued. What little has been done in this department, has had reference solely to the human body; and "almost the only essays at a general illustration of the subject have issued in the ridiculous notion, that as the body grows old, so it retrogrades into a lower station in the scale of the animal creation." The study of the changes of natural degeneration in old age is important, as affording a basis for the interpretation of many phenomena, which are to be regarded as morbid rather in their prematureness than in their essential nature; and these are grouped by Mr. Paget under the following heads:—

1st. *Wasting* or *withering*, as in the ordinary emaciation of old age; some parts being entirely removed by absorption, whilst others are only decreased in size, and lose the succulency of earlier age.

2d. *Fatty degeneration*, as shown in the tendency to the accumulation of fat in many tissues, especially the bones; the *arcus senilis* of the cornea has been shown by Mr. Canton to possess this character; and the fatty degeneration of the arteries of the aged is well known to be a most ordinary occurrence.

3d. *Calcareous degenerations*, as shewn in the gradually increasing proportion of earthy matter in the bones, in the ossification of parts that remained cartilaginous during the period of vigour, and in the tendency to earthy deposits in the arteries and other parts.

4th. *Pigmental degenerations*, as shown in the gradual accumulation of black pigmental matter in the lungs, the mucous membrane of the alimentary canal, and even in the coats of the arteries.

5th. *Thickening of primary membranes*, as seen in the tubules of the testes, the inner membrane of the blood-vessels, and the walls of the cartilage-cells.

The following are enumerated by Mr. Paget as the characters in which true degenerations are distinguished from disease:

"1st, and before all others, it should be a change naturally and usually occurring, in one or more parts of the body, at the approach of the natural termination of life, or, if not then beginning, yet then regularly increasing.

"2. It should be a change in which the new material is of lower chemical composition, i. e., is less remote from the inorganic matter than that of which it takes the place. Thus, e. g., fat is lower than any nitrogenous organic compound, and gelatine lower than albumen, and earthy matter lower than all these.

"3. In structure, the form should be less developed than that of which it takes the place: it should be either more like inorganic matter, or less advanced beyond the form of the mere granule or the simplest cell. Thus the approach to crystalline form in the earthy matter of bones, and the crystals in certain old vegetable cells, are characteristic of degeneration; and so are the granules of pigment and of many granular degenerations, and the globules of oil that may replace muscular fibres or the contents of gland-cells.

"4. In function, the part should have less power in its degenerate than in its natural state.

"5. In its nutrition, it should be the seat of less frequent and less active change, and without capacity of growth, or of development."

There are many things which show that the assumption of these characters is to be ascribed, rather to a defect, than to a perversion of the vital force or of the conditions of nutrition:

"Thus (*a*) these are all apt to occur in a part of which the functions are abrogated; a motionless limb wastes or becomes fatty as surely as an old one does. (*b*) They often occur, too, in parts that fail to attain the development for which they seemed to be intended. Thus, e. g., fatty degeneration usually ensues in the cells of unfruitful Graafian vesicles. (*c*) They bear also a certain general analogy to the changes that ensue in some of the materials that are habitually excreted from the body; in the construction or composition of which materials one seems to have an instance of the gradual supervention of the ordinary or imitable processes of chemistry. (*d*) Again, they display living parts tolerating the presence and incorporation of inorganic or dead matter; fat being commonly infiltrated about degenerate cells and membranes, and

earthy matter with it, even in the crystalline form. (*e*) And lastly, and perhaps most clearly, the origin of degenerations from defective, rather than from perverted, conditions of nutrition, appears in the fact that one, at least, (namely, fatty degeneration), of them may be produced artificially."

The degeneration of lymph may commence at any period after its formation; and that which most obviously determines it, is the continued suspension of the conditions of nutrition. We shall first speak of its *fibrinous* element. In the *first* place, this may waste or wither, becoming firmer and drier, passing into the state which Rokitansky has called "horny;" the fibrin in these cases shows no marks of development into tissue, but retains its ordinary structure, being only drier and more compact. *Secondly*, fibrin is subject to a degeneration, which is comparable to the fatty degeneration of ordinary tissues; this is an extremely frequent occurrence, presenting itself in the fibrinous effusions poured out in the lower forms of inflammation, or in those of cachectic individuals. The softening and disintegration of the clots within the heart, which Mr. Gulliver has described, correspond closely with the like processes in inflammatory lymph. The whole substance is seen to be dotted with granules, which are known to be oil-particles by their peculiar shining, black-edged appearance; and the fibrin, no longer rendered transparent by acetic acid, loses its toughness and elasticity. It appears to be usually by such a degeneration, that fibrinous matter, which has firmly coagulated, softens and becomes capable of absorption:

"I suppose it may be considered as a general truth, that the elements of a tissue cannot be absorbed so long as they retain their healthy state. There is no power of any absorbent vessels that can disintegrate or decompose a healthy portion of the body: for absorption, there must be not only an absorbing power, but also a previous or concurrent change, as it were a consent, in the part to be absorbed; so that it may be reduced (or, rather, may reduce itself,) into minutest particles, or may be dissolved. And this change is probably one of degeneration, not death, in the part; for dead matter is rather discharged from the body than absorbed.

"Now there are some facts which indicate the probability that the fatty degeneration is that which commonly precedes the natural absorption of many normal parts; or, rather, that, in the change which they undergo before absorption, fatty matter is one of the products, and that the principal evident difference between the atrophy of a part which is manifested by its wasting, and the atrophy which is manifested by fatty degeneration, is, that the fatty matter, which is absorbed in the former case, is retained in the latter. However this may be, it is certain that the disintegration and fatty degeneration of the fibrin-products of inflammation bring them into a state most favourable for absorption; indeed, one may see in fibrin thus changed many things which, in regard to the fitness for absorption, make it parallel with chyle. Of such absorption of fibrin we may find many instances. In rheumatic iritis we may believe the lymph to be fibrinous; but we see its complete absorption taking place; and the recent observations of Dr. Kirkes on the rarity of adhesions of the pericardium, in comparison with the frequency of pericarditis, may be in the same manner explained. In rheumatic pericarditis we may be sure fibrin is effused; and the observed friction-sound has, in at least one case, proved its coagulation; yet in this case, when death occurred four months afterwards, scarce a trace of fibrin was found in the pericardium: it had been absorbed, and the degeneration I have been describing was probably the preparation for its absorption.

*Thirdly*, examples of the calcareous degeneration of fibrin are shown in the ordinary formation of phlebolithes from clots of blood, and in the calcareous deposits which are found imbedded in the fibrinous vegetations of the valves of the heart. This form of degeneration, however, is much more frequent in purulent fluids, and in later developments of lymph. *Fourthly*, pigmental degenerations are often seen in the fibrinous lymph effused in peritonitis, which presents shades of gray and black, that are due to the presence of pigmentary granules.

A similar series of degenerations is seen in the *corpuscular* elements of lymph.

*First*, their withering is seen in certain elements of the dull ochre-yellow-coloured, and half-dry material contained in lymphatic glands that have undergone chronic and nearly stationary scrofulous enlargements. In this substance are found abundant collapsed and shrivelled cells, which might be supposed to be dried pus-cells, or corpuscles of chronic tuberculous matter, were it not that some of them present an approach to the character of fibre-cells, into which it is certain that neither pus nor tubercle-cells are ever developed. The corpuscles found in the pus of chronic abscesses, are believed by Mr. Paget, from their likeness to the foregoing, to be rather withered lymph-corpuscles, than true pus-cells. *Second*, the lymph-cells are changed by fatty degeneration into granule-cells, or exudation-corpuscles; which, as Reinhardt has shown, may also be derived by a similar process from the primary cells of almost all other, both normal and abnormal, structures. This form of degeneration is particularly apt to occur in the products of inflammation in the nervous centres and in the lungs, but it is by no means confined to those organs; and it may take place alike in the early forms of lymph-cells, and after they have already elongated and attenuated themselves into fibre-cells, and also after they have degenerated into pus-cells. The following are, briefly, the stages of this transition, which corresponds exactly with that so commonly observable in the cells of the liver and kidney:

"The lymph-cells, which may have at first quite normal characters, such as I have assigned to 'primordial cells,' present a gradual increase of shining black-edged particles, like minute oil-drops, which accumulate in the cell-cavity, and increase in number, and sometimes in size also, till they nearly fill it. The fatty nature of these particles is proved by their solubility in ether: and their accumulation is attended with a gradual enlargement of the cell, which also usually assumes a more oval form. Moreover, while the fatty matter accumulates, the rest of the contents of the cell, becomes very clear, so that all the interspaces between the particles are quite transparent; and, coincidently with all these changes, the nucleus, if any had been formed, gradually fades and disappears."

This kind of degeneration, as in the case of the fibrinous element, appears to be preparatory to absorption, as probably happens in the "clearing-up" of the solidified lung after an attack of pneumonia. The calcareous degeneration of the lymph-cells is not so often seen, but sometimes presents itself coincidently with the preceding; of the pigmentary degeneration we have a very common example in the colouring of the cells of bronchial mucus already referred to.

The most frequent of all the degenerations of lymph, however, is into *pus*, this change ensuing in nearly all cases in which the lymph is placed in conditions unfavorable for its development. That such a change does take place, there can now be no doubt, since every gradation can be seen, from the most characteristic form of lymph-cell to that of pus-cell; and it is very questionable whether pus is ever, what it was so long undoubtedly regarded, an original or primary product of inflammation. "We cannot," as Mr. Paget observes, "always discern a preliminary lymph-stage; but neither can we always distinguish lymph-cells from pus-cells, nor can we see in how very brief a time the transformation may be accomplished." Other rudimental cells, besides those of the lymph, may be so altered as to take on the appearance of pus-cells; thus in many of the supposed cases of pus in the blood, the bodies taken for pus-cells were certainly only altered white corpuscles. When it occurs as a product of inflammation, however, the pus-cell may be pretty safely regarded as an ill-formed or degenerate lymph-cell: and the variety of form which it will present will partly depend upon the previous quality and grade of development of the lymph cell, and partly on the further degenerations which may have taken place, after the characters of the pus-cell have been acquired. The following is Mr. Paget's account of the typical conditions of the pus-cell; and of the principal degenerations which it may undergo:

"In specimens of what might be called 'good' pus, we may find three principal forms. There are—1st, some corpuscles presenting the peculiar and all-known granulated or wrinkled appearance of pus-cells, but from which

water will raise up no cell-wall: 2, from others, like these at first sight, water will raise a cell-wall, and will show that the former kind consist of only such a substance as forms the contents of these: 3d, in others, even when no water is added, a cell-wall is visible, and within this are granulated contents, with a more or less distinct nucleus imbedded in them. In all these forms, moreover, the addition of acetic acid usually displays a single or a bipartite or tripartite nucleus. Now, it may be that these represent three different stages of the pus-cell, either developing, or, more probably, degenerating; but I think it is much more likely that these forms are the results of the purulent degeneration beginning in lymph-cells at different stages of their development. There is so remarkable a correspondence between these three varieties of pus-corpuscles, and the three chief forms which I described as observable in the development of the primordial cell of lymph, that one cannot but suspect that the three forms in the pus represent corresponding and similar degenerations from the three forms in the lymph.

"When once formed, the pus-cells, if they are retained within the body, have no course but to degenerate further; it is characteristic of their being already degenerate, that they can neither increase nor develope themselves. The various corpuscles found in pus, besides those I have already mentioned, must find their interpretation, in these degenerations; for the pus-cells are prone to all the degenerations that I described as occurring in the lymph-cells.

"*a*. They may wither, as in the scabbing of pustular eruptions, or in long-retained and half-dried strumous abscesses.

"*b*. Or, they may be broken up, whether before or after passing into the fatty degeneration, which is one of their most common changes, and in which they are transformed into granule-cells. It is this breaking-up into minute particles which, probably, precedes the final absorption of pus.

"*c*. Or lastly, both the cells and the fluid part of the pus may alike yield fatty and calcareous matter, and this may either remain diffused in fluid, or may dry into a firm mortar-like substance.

"It is to such degenerations as these, in various degrees and combinations, and variously modified by circumstances, that we must ascribe the diverse appearences of the contents of chronic abscesses and the substances left after their healing."

But the same kinds of degeneration may occur in the products of inflammation after they have advanced further towards complete organisation. Thus adhesions not unfrequently degenerate by wasting, seldom or never by passing into the fatty state; but very commonly by becoming calcified, the product having sometimes an approach to the character of true bone, but much more frequently having the earthy matter deposited in an amorphous form, as if, as Rokitansky has remarked, it was a residue of the transformation of the more organised tissue whose soluble parts have been absorbed after decomposition; and lastly, by developing pigmentary matter, which is sometimes seen in adhesions of the pleura, but much more commonly in those of the iris.

Such, then, according to Mr. Paget, are the principal forms of degeneration exhibited by the more or less developed products of inflammation. We consider that he has done good service in thus attempting to classify them, and to point out the direction for further inquiry. The whole subject of degenerations may be regarded, in fact, as of even more pathological importance than that of development; and deserves the fullest investigation. For it is the essential character of by far the greater number of morbid processes, that the nutritive material is applied to some purpose different from its regular destination; and that the product is, in relation to the normal one, of a degenerate kind. And even where an attempt is made (so to speak) to develope a normal structure, as in the organisation of lymph thrown out for the repair of injuries (whether produced by external causes, or by the morbid actions of tissue itself), that structure, until it is fully adopted into the system and made completely a part of it, is peculiarly prone to undergo degeneration. Now it has been from dwelling upon this very frequent destiny of fibrinous exudations, and from passing by the cases in which they do remain as constituent parts of the organism, that Mr. Simon has been led to the notion that fibrin is itself a

degenerating product. It may be that the last named instances are the exception rather than the rule; but this is because, in all ordinary cases in which these exudations are thrown out, causes of degeneration are operating. It is in those simplest cases in which the reparation proceeds with the least amount of those disturbing influences which tend to produce degeneration,—as, for example, in the reunion of the two ends of a tendon after subcutaneous division,—that the organisation of the fibrin goes on most after the fashion of ordinary nutrition, and with the most complete result; and we seem, therefore, clearly entitled to affirm, that of all the elements of the blood, the fibrin is that which is the most prone to become organised, and is that which affords the ordinary pabulum for the development of the tissues.—*Brit. and For. Med. Chirurg. Review, April*, 1851, *p.* 487.

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## 7.—NATURE OF THE FIBRIN OF THE BLOOD, AND ITS RELATION TO DISEASES.

(From a Review of Mr. Simon's Lectures on the subject, by the Editor of the Brit. and For. Med. Chirurg. Review.)

[One of the most important opinions in pathology lately advanced, is that of Mr. Simon and Dr. Zimmerman, viz., that "the Fibrin of the Blood is not to be regarded as its most organizable portion, but as an element resulting from the *degeneration of the tissues*, and destined to speedy elimination from the circulating current," in opposition to the opinion commonly received among physiologists, viz., "that Fibrin is that ingredient of the blood, which, in the ascending scale of development, stands next for appropriation into the living textures of the body, and which represents the ripeness, perfection, and nutritiveness of the blood." The reasons Mr. Simon advances in opposition to the commonly received doctrine that fibrin is the most organisable and nutritive part of the blood, are as follow:—]

"First, I find that fibrin is undiminished by bleeding, however, frequently repeated; nay, that it often, or even usually, increases under this debilitating treatment: its highest figure given in Andral's book (10·2) was at a fourth bleeding: and Scherer found it was high as 12·7 at the third venesection in a case of pneumonia. I find that under many other circumstances of exhaustion and weakness and inanition, during the progress of starvation, during diseases essentially anæmic, during violent fatigue, and the like, its proportion has been found at least as high, perhaps higher, than in the inflammatory process. And as in these respects I find its proceeding to be in direct contrast to that of the red globules (which we know to be potential elements in the blood, and which are at once reduced by bleeding or starvation,) so also do I find a similar contrast in another striking particular. Messrs. Andral and Gavaret, in the course of their extensive researches in the comparative physiology of the blood, ascertained that an improvement in the breed of an animal tended always (*cæteris paribus*) to increase the proportion of its coloured blood-corpuscles; they found that the same improvement tended likewise to diminish the proportion of its fibrin. And I find further indications of the same inverse ratio between the fibrinousness and the perfection of the blood, in the facts—that there is little or no fibrin in the blood of the fœtus, none in the egg, none in the chyme, and less in the blood of the carnivora (who feed on it) than in that of the herbivora.

"Some of these facts, derived from very different sources, appear quite inexplicable on the theory that fibrin is essential to the progressive development of the tissues; and the opposite inference seems unavoidable, that it must be considered an excrementitious product, derived from the waste of the tissues or the oxidation of the blood, and in progress of elimination from the system. This conclusion, carried into the domain of pathology, would lead us to suppose, that an augmented proportion of fibrin in the blood (whether occurring in active disease, or within the limits of apparent health) can be taken as an indication only of increased labor and waste in certain elements of the body, not of an increased development in the resources and nutrition of the blood. And on the same grounds it would appear that a super-fibrination of the blood.

so high a rank in their pathology, merely because of its physical tendency to settle in a solid form."

[These opinions of Mr. Simon are answered as follows by the Editor of the 'British and Foreign Medico-Chirurgical Review.']

1. "Fibrin is undiminished by bleeding; nay, it often. or even usually increases under this debilitating treatment." This only proves that the process, whatever be its nature, on which the generation of fibrin depends, is not checked by loss of blood, a fact which affords no indication whatever that the fibrin is a product of disintegration. If the fibrin be, as we believe, that element of the blood which is most directly and constantly required for the maintenance of the nutritive operations, it is easily conceivable that the All-wise Creator should have placed this process out of the reach of those accidents which affect the proportion of other less important elements of the blood; just as the action of the heart is entirely withdrawn from the control of the human will, and the respiratory movements are provided for by an instrumentality over which it can exert but a subordinate influence. Let it be remembered that if fibrin be (as we believe) albumen undergoing vitalization, its *material* will always be ready, so long as there is any albumen in the blood; and if (as seems not improbable) the very act of circulation through the living tissues is one means whereby the vitalizing influence is exerted, this will be perpetually going on, so long as the circulation continues.

It must be borne in mind, too, that a new supply of fibrin, as well as of albumen, is introduced into the blood after every act of digestion; for there is distinct evidence that fibrin is generated (at the expense of albumen) during the passage of the chyle through the lacteals; and if the researches of M. Cl. Bernard are correct the liver exerts a similar elaborative agency upon the albuminous matter which has been received into the blood of the vena portæ. Further, in all the cases alluded to by Mr. Simon, a very active inflammation was somewhere going on in the system; and thus, according to the current doctrine, an unusually active production of fibrin was taking place at the expense of the albumen of the blood. If not generated from this material, but resulting (as Mr. Simon thinks) from the disintegration of the tissues, how is it that in an attack of pneumonia, or of acute rheumatism, in which there is no reason to suppose that any extraordinary disintegration of tissues takes place, the proportion of fibrin in the blood mounts up to three, four, or five times its normal average?

2. "During diseases essentially anæmic, during violent fatigue, and the like, the proportion of fibrin has been found at least as high, perhaps higher, than in inflammation." We very much question whether, in any of these cases, the increase in the proportion of fibrin took place without the presence of the inflammatory condition. Every one knows that inflammatory complaints are peculiarly liable to occur when the system is imperfectly nourished: and Andral distinctly states, that in the three dogs which he submitted to experiment, two of them being wholly deprived of food, and the third partially so, the elevation in the proportion of fibrin from 2·3, 2·2, and 1·6 parts, in the three individuals respectively, to 4·5, 4, and 3·3 parts, was *coincident with inflammatory changes in the stomach*. Further, as in these diseases "essentially anæmic," there is no reason to suppose that a peculiarly rapid disintegration of the tissues is going on, we cannot see how the increase of fibrin in the blood of patients suffering under them, is in the least degree confirmatory of Mr. Simons doctrine. That the deficiency of nutrient material does not prevent the generation of fibrin out of what the blood contains, may be explained as we have just shown, in a manner very different from that which Mr. Simon would have us adopt.

3. The argument founded upon the comparative amount of fibrin in different breeds of animals, as determined by the observations of Andral and Gavarret, can scarcely be admitted to have much weight, when it is recollected, that the breeds here spoken of were *herbivorous* animals, to which it is natural to possess *more* fibrin and fewer corpuscles than the carnivora, and that they were *domesticated* animals, in regard to which the phrase "improvement of breed" often means something very different from an increase of the

general vigour. We can fancy that a stall-fed cow, yielding her eighteen quarts of milk daily, would be regarded by the farmer as a much more valuable animal than a hardy mountain cow affording not one third of that quantity; but the latter is well known to be the one possessing the greatest amount of vigour, and to be the least susceptible of disease. It is, in fact, the object of the breeder to produce a state of *artificial plethora*; and in this condition, as is well known, is characterized in man by an increase in the proportion of red corpuscles, without any corresponding increase, or even with a diminution, in that of the fibrin of the blood. If we extend our observations on comparative physiology a little further, we find that the red corpuscles, which Mr. Simon affirms to be "potential elements" of the blood, are altogether absent in the lowest known animal of the vertebrated subkingdom (we allude to the curious little *amphioxus* or lancelet,) and that scarcely any approach to them is presented through the whole invertebrated series, notwithstanding that among some of these there is an extraordinary amount of vital activity; consequently we cannot help looking upon their presence as connected with some function which is to be specially, if not exclusively, performed by the vertebrata. On the other hand, the presence of fibrin is universal; and its proportion in the blood is found to bear a close relation to the formative activity, in cases in which this is subject to periodical variations. Thus Mr. Newport found, that in the larva of the insect, at the period immediately preceding the exuviation of the skin and the formation of a new integument, the blood is extremely coagulable; whereas for some little time after this process has been performed, the blood is so deficient in coagulability, that it does not (as at other times) close the orifices of wounded vessels,—as if in consequence of the temporary exhaustion of the plastic material by the new production of the tegumentary tissue. In the pupa state, during which the formative activity is the greatest, and the disintegration of the living tissues must be reduced to its minimum by the complete inactivity of the animal the coagulability of the blood is great. But the imago state, in which little or no further growth or development takes place, and in which, on the other hand, the activity of movement might be expected to produce an unusual disintegration the plastic element seems to be almost entirely withdrawn.

4. "Further indications of the same inverse ratio between the fibrinousness and perfection of the blood," are found by Mr. Simon in the facts, "that there is little or no fibrin in the blood of the fœtus, none in the egg, none in the chyme, and less in the blood of the carnivora (who feed on it) than in that of the herbivora." We are at a loss to see what possible argument can be drawn from any of these facts, except the first; and of this—the absence of fibrin in the blood of the fœtus—we must take leave to express a doubt. Mr. Simon does not cite his authority for the statement; and it is entirely opposed to all we know of the condition of the blood in other organisms, in which formative actions are going on energetically,—as in the larvæ of insects, which may be regarded as embryoes fitted to maintain an independent existence, and to procure and ingest their own food. The albumen of the egg does not stand in the relation of blood, but in that of food, to the chick; this food has to be assimilated by the nutrient organs before it can be converted into solid tissue; indeed, it would seem to be the special purpose of the germinal membrane to convert this raw material into the plastic circulating fluid. To advance the absence of fibrin in the egg, therefore, is an argument for its non-essentiality in the blood, is just as unsatisfactory an argument as it would be to say, that because fibrin is not to be found in bread or milk, its presence in the blood has no relation to the nourishment of the tissues.

Mr. Simon does, indeed, make a near approximation to this absurdity, in advancing the absence of fibrin in the *chyme* as one of his "indications." But what does he say to the presence of fibrin in the *chyle*; to its progressive increase in proportion as the chyle advances along the lacteals, and more especially after its passage through the mesenteric glands; and this under circumstances which almost exclude the possibility of attributing its first presence and subsequent increase to the introduction of any disintegrating material,—to anything, in short, but to that assimilating operation which prepares the

chyle for the part which the blood is to perform, and gradually converts it into a liquid which is fit to circulate through the sanguiferous system? We are equally astonished that Mr. Simon should think that the difference in the proportion of fibrin in the carnivora and herbivora, taken in connection with the nature of their food, furnishes any support to his views. Surely he must know full well, that the fibrin of muscular flesh is reduced back to the state of albumen in the digestive process, and that there is no difference between chyme formed from animal food and that produced by the digestion of vegetable substances, except that which depends upon the different proportions of its protein compounds, its oleaginous matters, its saccharine and other constituents. So long as the food supplies albuminous matter in adequate amount, so long the proportion of fibrin in the blood is capable of being sustained; and, as we have just now remarked, we can see no reason why it should not be sustained, until all the albumen of the blood is exhausted. What is the explanation of the larger proportion of fibrin in the blood of herbivora than in that of carnivora, we do not pretend to say: but Mr. Simon's theory does not help him to accounting for it, since he will scarcely maintain that the disintegrating processes are more rapid in the former group than in the latter,—the very contrary, indeed, appearing to the fact. It is to be remembered, however, that little reliance can be placed upon the numerical proportion of this or any other of the elements of the blood, in estimating the share which it takes in the formative processes. If the current doctrine be correct, there is a continual production of fibrin, and as constant removal of it from the circulating current by the formative operations taking place throughout the body; and the amount which circulates in the blood may be considered as a sort of "floating balance," which affords no indication of the magnitude of the two sets of transactions which it serves to accommodate.

Such are the merits, in our apprehension, of the principal arguments assigned by Mr. Simon for abandoning the orthodox doctrine, and embracing the heresy newly imported from Germany. We trust that we are as much inclined as Mr. Simon to exchange old errors for new truth, provided the latter can be brought to our understandings; but we must be satisfied it *is* truth, before we abandon for it the doctrines that have been current among physiologists and pathologists ever since they began to reason correctly on such subjects. Of the objections which he raises to the current notions, on the basis afforded by the history of the ulterior development of fibrin, we shall not now stop to point out the fallacies.—*Brit. and For. Med.-Chirurg. Review, April*, 1851, *p.* 472.

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## 8.—DISINTEGRATION OF THE BLOOD.

By Dr. James Paxton, Rugby.

[It seems that the circumstances which take place in this world, whether of a political or religious character, obey a certain order of arrangement. They occur, as it were, in *cycles*. This is especially the case with respect to opinions. We are rapidly again ascending to that point of humoral pathology which was maintained by our ancestors hundreds of years ago; but with this difference, that by means of our superior instruments, and other facilities of acquiring knowledge, we are able to give better reasons for our belief in certain theories. Among the most interesting subjects of inquiry in the present day will be found to be the blood in its various phases of development, integrity, and decay. The following paper by Dr. Paxton is one of the most interesting and comprehensive which we have perused.

Numerous inspections of the blood in a defective state have led to the arrangement of a group of diseases, strictly referred to a disturbed state of the circulation, producing either a transposition or total rejection of some of the vital elements. Dr. Paxton first considers the leading principles in a branch of hæmatology specially relating to *privations of the blood*. He says:]

I have adopted the term *disintegration* as most expressive of a dissociation of a triple compound of serum, fibrin, and hæmatosin. During sound health these organic elements are retained in the vascular system. The chemical

products, or some contingent or new forms of organic matter only, are excluded by means of the secretions. In fact, to have any of the organisms of the blood present themselves, ex-circulatory, is opposed to the laws of the integrity of the circulating fluid, and would at once induce suspicions of a disorganization in its composition. We might bring under review a large class of diseases which seem to originate in disturbances of the organic elements, but will confine our notice to those affections in which the vital forces expel some of these constituents. One of the most remarkable instances of this is the expulsion of serum in *morbus Brightii*. Here the blood becomes deprived of its serum; on the one hand, a part escapes into the cavities and the tissues of the body, while another part is removed by the agency of the kidneys: on the other hand, there are diseases in which the gastro-enteritic apparatus is employed in the performance of a similar task, viz., to deserumize the blood; as in diarrhœa and cholera, wherein a double process is effected—first, a portion of the blood is deserumized, and secondly, it is discharged from the constitution. In other instances the serum, after its exclusion from the vessels, is detained in close cavities in the pleura, the tunica vaginalis, or in cysts. In such situations it is liable to remain with great inconvenience to the functions of important viscera. When deposited in the areolar tissue of the limbs, I need not say that their mechanism is exceedingly impeded. This is a general view of that species of disintegration which is known by a loss of serum. Although the objection might be raised that these fluids are mere secretions or exhalations, this is altogether a verbal distinction, inasmuch as the blood is minus the quantity of albumen contained in the fluids just named. To confine myself to a limited exemplification of deserumization: It may be artificially induced by the application of a blister to the skin.

The poison of the cantharides inflicts an injury, which ends in an effusion of serum under the epedermis, the blood having been deprived of as much serum as is visible in the vesication. Superficial burns and scalds subject the locality to rapid withdrawal of serum. Certain topical injuries cause topical disintegration of the blood, and an effusion of serum. Obstructions in the veins invariably produce a disengagement of serum. Thus the pressure of the gravid uterus, or of pelvic tumours on the iliac veins, frequently occasions effusion in the lower extremities. In phlegmasia dolens, by an inflammation of the saphena and its branches, or of the femoral vein, the current of the blood being interrupted, exudations into the cellular tissue certainly follow. The fluids in œdema, hydrocephalos, hydrothorax, or of hydrocéla, prove their identity with the serum of the blood, by the albumen which, more or less abundantly, they contain. The pathology of limited dropsy or abstractions of serum appears scarcely explicable without a dissociation of the liquor sanguinis and red corpuscles. In cachexia the vessels may be feeble, *per se*, and incapable of transmitting the blood unimpaired, yet in leucophlegmatic temperaments it is more than probable that effusions originate in excess of serosity, and the escape of serum tends to afford relief by restoring, in some measure, the hæmatic standard. This is illustrated in an early scrofulus diathesis, where, in childhood, there is a disposition in the cerebral circulation to part with serum. The fluid which distends the ventricles of the brain contains albumen. Serous apoplexies likewise are of this character, notwithstanding the attack may arise from detention of blood in the sinuses, owing to disease of the heart. Taking into account the composition of the fluid in partial dropsy, and calculating the amount of albumen detected in it, we may conclude there must be partial disintegration of the blood. Nevertheless, structural and functional derangements of the vessels, as well as their contents, may be involved in local dropsy. Hence mechanical causes, or a ligature on the femoral artery, will occasion a temporary œdematous tumefaction, in consequence of an interruption to the current of the circulation. One of the results of an impediment in the portal system is a collection of serum in some part of the body. Instances of limited disintegration of the blood could easily be multiplied, but I will only mention its manifestation in œdema of the arm, when the axillary glands are implicated.

Limited collections of serum constitute the first series of disintegrations of

the blood. The second series shows an unlimited serous effusion; its remote cause is more obscure than the former, and it is by a combination of circumstances that its integrity is not maintained. Anasarca is one of the effects of a slow process of general disintegration of the blood, and general exudation of the liquor sanguinis and colourless corpuscles. Already an example of this form of deprivation of serosity has been referred to in albuminuria, where there is an excessive tendency of the serum to separate from the mass of the circulation. During the progress of this disease the liquor sanguinis is continually escaping by the kidneys, or is infiltrating into the areolar tissue, and perhaps finds its way into the pleura or peritoneum. Under these circumstances it has been ascertained that the relative proportion of corpuscles no longer continues. In one case the hæmatometer indicated 47 per cent. of serum, with a specific gravity of 1015, the healthy standard being 1030. To explain this circumstance I found, at the commencement of the complaint, the urine contained so large a quantity of serum, that when heated, it was completely solid. The development of albuminuria is discovered by the unceasing circulation of the vital energies to exclude a quantity of serum from the vascular canals. Pathologists have apprehended a mutilated state of the blood; if so, it is desirable to define that state with as much precision of ideas as science will warrant. Dr. Johnson, of King's College, very properly considers that the existence of albumen in the urine is due to a disturbance in the circulation. Dr. Ranking, with his usual clearness of judgment, after a comprehensive review of the various publications on Bright's disease, arrives at the following conclusion, that "there are diseases which attack the liver, spleen, and kidneys, which depend on an abnormal condition of the blood." All the changes described so accurately by microscopists as taking place in the interstitial structure of the tubuli of the kidney are purely accidental, and altogether the result of "albuminous dyscrasy," induced by intemperate habits, unhealthy residence, or modes anti-hygienic. The tendency of the serum to become ex-circulatory can the more readily be accounted for by supposing that incidental circumstances have contributed to a loss of cohesion dependent on a loss of vital affinity in the sanguineous elements. While the blood preserves a perfectly healthy condition, its organic principles are inseparably retained within the boundaries of the circulatory system. There is no exception to this law. When, however, the renal organs, whose office is solely to secrete and convey the chemical material, is compelled to assume a new office, and convey a physical material of the blood, and when also we detect the latter in remote and foreign situations of the body, we may expect to find a corresponding deficiency in the circulation. As we find a low specific gravity of serum in albuminuria, so we ought to feel no difficulty in believing what some of the most enlightened pathologists have conjectured, that this affection is essentially a disease of the blood. It does not appear that the kidneys are anything more than mere agents in the removal of albumen, and in the performance of that duty sustain damage from retention of fibrin and fat globules; indeed, the quantity of urine is seldom to be attributed to an error of these organs, but is rather to be imputed to a disturbed state of organic principles in other places. The granular degeneracy is entirely the result of protracted serous disease. Dr. Prout, in his Gulstonian lecture at the College of Physicians, exhibited the kidneys of a patient of Dr. Rowe's, who died of albuminuria, which were perfectly free from disease. They transmitted serum without injury to their capacity or structure. Albuminuria consequently arises from a lesion of the blood, capable of demonstration. There are a variety of causes, particularly in large cities, which are calculated to impair the sound state of the blood. Dr. Bright instituted a series of experiments by taking the patients promiscuously as they lay in the wards of the hospital. The whole number amounted to 130, out of which he found no less than eighteen to have coagulable urine. I am in the daily habit of testing the urine, but I confess I do not find albumen of so frequent occurrence. In rural districts, among an agricultural population, the condition of the blood is less deteriorated.

Dr. Owen Rees and others have detected albumen in the urine of persons dying from complaints quite unconnected with lesions of the kidneys. He

judiciously observes, that, "it is not right to lay much stress on albumen in the urine as indicative of nephritic disease." The term albuminaria would be equally applicable to every species of disorder in which there is an adventitious collection of serous fluid; it might be applied to all the diseases in the order *Aquosæ* of Cullen. Every species of dropsy, as it regards the proximate cause, belongs to this series of disintegration—namely, deserumized blood. Sometimes there may be a drain of serum through the renal organs, at other times the serum is detained in certain parts of the system; be this as it may, the discovery of serum ex-circulatory would always lead to the inference of abstraction from the blood. In cases of Bright's disease we actually detect a deficiency in almost every analysis. On the contrary, an excess of serum, as in anæmia, may probably act in the same way in causing exosmose into the tissues in consequence of a dissolution of a portion of the triple organization of the blood.

The third series of disintegration consists in a deprivation of fibrin as well as serum. The most striking illustration occurs in malignant cholera. It is unnecessary to describe all the attendant phenomena, but to consider the hæmatology of this disease. After the reception of the choleraic poison, the abstraction of both serum and fibrin takes place frequently with such sudden and extraordinary violence, that during an attack from six to twenty-four pounds of sero-fibrous fluid is expelled by the action of the stomach and bowels, in the course of a few hours. Mr. Grainger, who devoted much time and attention to investigations of this disease on the continent and in this country, in his lecture at St. Thomas's Hospital last year, describes cholera as an affection of the blood. "That the best results which have been attained by the German pathologists, particularly those of Berlin, is that the first impression is aerial, acting on the blood, and thus the blood became poisoned." Dr. Wells has expressed in a short sentence his opinion of the nature of cholera—"A loss of vitality of the blood." Both of these gentlemen approach the true theory. One would imagine it impossible to overlook the destruction of a large portion of the colourless corpuscles. The alvine discharges, consisting chiefly of serum and coagulated fibrin. During health these substances are held in solution, but the vital force being withdrawn the albumen coagulates, the fibrin is precipitated, and we behold these substances in curdled flocculi, floating in the dejections. There is no one who has examined the blood in algide cholera who has not remarked its altered appearance. The dark colour and thick consistence have led some to compare it to tar, others to currant-jelly. Dr. Parkes believes the fibrin loses its power of combination, and is poured into the intestines in flocculi, known as the solid ingredient in the so-called rice-water evacuations. Much as we may regret that the remote source of this scourge of the nations is still a hidden mystery, the immediate is patent to our inspection. We perceive the analogy there is between the action of the choleraic poison on the system, and the operation of an over-dose of tartarised antimony or arsenious acid. Indeed there is so great a resemblance of symptoms attendant on poisoning with arsenic, that it has often been mistaken for an attack of cholera. A large portion of blood has been disintegrated; this is followed by uncommon efforts to expel the affected organisms, and the spasmodic action seldom ceases until the whole of the affected corpuscles escape from the circulation, unless in fatal cases, where the organs concerned in the disengagement of the poison at length are disabled and unequalled to the task. If the transparent corpuscles are very partially invaded by timely aid of medicine and *vis vitæ* of the constitution, a reaction may be established which may neutralize the choleraic virus. To use the words of an eminent Professor:—"There are instances of the operation of the vital actions, accomplishing the expulsion of noxious matter, and of that part of the animal fluid which have been corrupted by it."* This appears to be the course and determination of cholera, at least under a mild form. The dead corpuscles are excluded from the mass of the circulation. The assimilative process makes up the deficiency and restores the healthy tone of the blood.

It is not intended at this time to present tables of analysis: it will answer the purpose of the argument, in support of the theory advanced, to state that

* Dr. C. J. B. Williams' Principles of Medicine, p. 467.

the blood of a healthy person contains of solid residue, on an average, 210 parts per 1000; but when an attack of Asiatic cholera has abstracted the transparent corpuscles, fibrin, and liquor sanguinis, the solid residuum amounts to 360 parts per 1000. In hæmatological inquiries there will be greater irregularities in the results. The relative proportions of the organic principles are not so much dependent on age or sex as on habits of body and modes of life.

A fourth series of disintegrations of the blood is apparent in the separation and deposit of its fibrin. There is a frightful epidemic, well known in the West India islands, in which the fibrin becomes ex-circulatory, and eventually undergoes a slow condensation, and, as in all fibrinous deposits, it is then rendered insoluble. Such is elephantasis. The parts most frequently affected are the lower extremities, but immense collections may be situated in the loose cellular tissue of the scrotum, or accumulated in the subcutaneous tissue of other parts. There is a class of tumours also with which we are more familiar, not only occupying the exterior of the body but invading the interior likewise; the morbid anatomy of which shews them to consist principally of condensed fibrin. The several stages of production are extravasation of serum, the aqueous portion of which evaporates by perspiration and exhalation from the lungs, leaving the insoluble fibrin under various forms. It has been demonstrated as intersecting scirrhous formations, and in such monstrous scrotal and preputial enlargements as such cases as *Hoo-loo's*, which are largely made up of fibrin, thrown out of the circulatory mass. The accretions distinguished as scirrhous, affecting the pylorus, the rectum, and the mamma, are of the same character. All these diseases are mainly composed of fibrinous exudations, in combination with, or existing as, a webb containing other substances, as fat globules, cancer cells, and albuminous fluid.

When fibrin is pure it often forms pseudo-membranes; as, for instance, in the adhesions of the pulmonary with the costal pleura, after a bad attack of pleuropneumonia. Inflammation induces a separation of fibrin; hence during inflammatory action fibrin is frequently poured into the canals lined with mucous membranes, as in croup, and in this specimen, where we have casts of the primary bronchiæ, produced by a transit of fibrin in acute bronchitis. The whole of this series are attributable to sanguineous derivations in consequence of an impaired vitalism of the blood, allowing of the exit of the liquor sanguinis by exosmose, or it may be ejected, under certain circumstances, by the energies of the animal powers. Fibrin while circulating in the system is always in solution, but when removed by disease it becomes solid.

The fifth series of cases of disintegration of the blood comprehends those affections in which effusions of red corpuscles or pure hæmatin is one of the most conspicuous features, as in scorbutus, purpura, and the petechiæ and vibices of typhus. The predisposing causes and primary sources of scorbutus have been traced to insufficiency of some needful article of diet, especially if the privation is attended by mental anxiety and alarm. Of the proximate cause there is no question. We know the blood is dehæmatized when hæmatin has visibly escaped from the circulation; when there is a deprivation of 60 or 80 per 1000 of colored corpuscles. The deficiency of fibrin, also, in most cases, has been noticed; hence Magendie called this disorder "Defibrination of the blood;" and truly the blood from the gums does not coagulate, for the crassamentum is loose and weak—"a semi-fluid of the consistence of syrup."

On reflection, we cease to wonder that diseases arise from modifications of the blood, when we take but a distant view of the numerous circumstances by which it may be altered. Atmospheric vicissitudes, aliment, drinks, respiration, and the condition of the nervous system, by which all the secretions are governed, exert a powerful influence on the blood, and produce numberless changes in the constitution.

Further inquiries are necessary to determine what value may be attached to the theory of disintegration of the blood. Of this I feel assured, we are advanced far enough to enable us to draw the conclusion that organic changes of the solids in general are not antecedent to an isolation of the elementary organisms, but depend on the dispersed and abnormal existence of the circulating corpuscular fluids. Hence the science of hæmatology deserves our

highest consideration, and must be eventually estimated as the very foundation of all pathological investigation.—*Provincial Med. and Surg. Journal, January 8, 1851, p. 1.*

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## 9—MALIGNANT TUMOURS OR CANCERS.

By GEORGE MURRAY HUMPHRY, Esq., Downing College, Surgeon to Addenbrooke's Hospital Cambridge.

[The word "destructive," if applied to these tumours, would probably explain their nature and tendencies better than the one usually employed. They are destructive, not only by destroying the tissues in their immediate neighbourhood, but also by the new tissue deposited being peculiarly liable to decay, causing breaches or chasms which may increase to a very great extent. These, then, are the leading features of these growths: first, degeneration of the natural tissues around it; and secondly, the tendency to decay of the tumour itself. There is no doubt in the investigation of this class of growths the microscope is a very valuable means of assisting us; nevertheless, the many difficulties and sources of error necessarily intertwined with the use of this instrument, should warn us against too implicit a reliance on the results which it has hitherto afforded us in morbid anatomy. It cannot be relied upon till the observer has bestowed much attention and time to its use. Time may cause it to be regarded as another and surer test, but at present the science is too much in its infancy to enable us to dogmatise upon the information it affords, without giving legitimate weight to other considerations.]

It is commonly agreed that the greater number of cancerous growths consist of a fibrous stroma, disposed in meshes which contain nucleated cells, nuclei, and granules, together with a thin serous or gelatinous fluid. The proportions in which these three elements are combined, vary greatly in the different species of cancer. In the scirrhous or hard cancer, for instance, the fibrous structure predominates; in the encephaloid or soft cancer the cells are more abundant; and the colloid or gelatiniform cancer is composed in great measure of jelly-like fluid. Neither of these elements examined separately are found to exhibit any decidedly distinctive characters, the peculiarity of the cancerous growth consisting not so much in the materials of which it is composed, as in the mode of their arrangement.

[The fibrous basis of cancer seems to resemble closely the common areolar or fibrous tissue, being composed of the peculiar compressed wavy filaments, intermixed often with well developed filaments of elastic tissue. In some cases, however, this fibrous basis does not possess so distinct a structure.]

The cell element of cancer has naturally proved an object of much interest, inasmuch as the essence of the disease would seem to be almost concentrated in it, the rapid growth and self destructive or decaying tendencies of cancer being to a great extent proportionate to, if not dependent on, the quantity of cells developed in the meshes of the fibrous stroma. Pathologists hoped, therefore, to find some distinctive structural peculiarities attaching to these cells whereby the nature of the disease might be recognised at once and with certainty. This expectation has not however at present been confirmed by observation: it is the opinion of those best qualified to judge, that cancer cells do not present any decidedly characteristic peculiarities, that they vary in appearance a good deal, that in each of their different forms they resemble some of the primary cells of other tissues, and that in the form, which from its frequent occurrence in specimens of well-marked malignant disease might be taken as the type, they are not to be distinguished from the cells of cartilage or the cells composing the deeper layers of epithelium. Indeed some of the structures which present in a sufficiently well-marked manner the practical tokens of malignancy, do not appear to contain the cancer cell at all as an ordinary constituent; such are some of the varieties of cancer of the skin and cancer of the muscular coat of the intestinal canal.

The cells commonly found in cancers, which may be seen in the fluid scraped from a section of the morbid mass, and to which the name "cancer-cells" has been applied, are larger than blood-globules, of about the same size or rather

larger than pus-globules, composed of a tolerably well-defined cell-wall, with one, two, or more nuclei, in which nucleoli may be often seen. The cell-wall is rendered transparent or dissolved by acetic acid, the nuclei being unaffected. The cells vary a good deal in shape, being round or oval, or elongated at one or both ends into a caudate or spindle form, or they may send out processes from various parts of their circumference. It is the general opinion, that they do not, at least ordinarily, advance beyond the cell-stage of organization, that they are not transitional to any other form of structure, but that having attained to a certain size they are disintegrated, and their constituent atoms are returned to the fluid from which they were derived; or by a process of endogenous growth they may become the parents of other secondary cells formed in their interior; that is to say, their nuclei and nucleoli enlarging and converted into cells may fill up the interior of the parent, and at the period of its dissolution may become set free and undergo like changes in their turn, the materials for the growth of their nuclei being furnished by imbibition through their walls. Some authors have described the cells to increase by fissiparous gemmation, and Dr. Bennett speaks much of their occasionally undergoing a retrograding process; the nuclei disappearing instead of enlarging, the cell-wall shrinking, collapsing, becoming infiltrated or intermixed with oil, and ultimately resolved into fragments and granules. He finds the yellowish masses often seen in cancerous tumours to consist in a great measure of cells thus altered.

With regard to the nature of these cancer-cells, and their physiological relations to the fibrous element and to the natural tissues of the part affected, it is not easy to form an opinion. By some authors they have been looked upon as independent existences, like entozoa or fungi, growing in the body and propagating themselves to distant parts through the medium of the blood by sporules, which find their way into the circulating current, either through the delicate walls of the capillaries, or through opening in the small vessels. It seems to me on the whole most probable that they are the result of some peculiar influence exerted upon the nutritive elements of the blood effused among the tissues by an altered or morbid state of the nutrition of the part, being in this respect, to a certain extent, analogous to pus-cells, which they also resemble, in their capacity to undergo further organization; and in their being in terminal, not transitional, stages of development. The two morbid products differ, however, in the important particular that the cancer-cells possess the property of self-multiplication, absorbing and assimilating the elements of the blood, whereas the pus-cells are dependent for their increase on the continuance of the inflammatory process causing fresh exudations, endued with similar tendencies to those from which they sprang themselves. There are some circumstances, such as the accumulations of pus in certain cavities or abscesses, which render it probable that even the pus-cells exert a certain assimilative influence upon the fluid or even the solid lymph effused in their immediate proximity, but they do so only in a slight degree, and with a force scarcely comparable to that of the cancer-cell. This point of difference between the products of inflammation and the elements of cancer, is of great importance, and constitutes one of the most marked features of their distinction.

Besides the cells just mentioned, there are commonly found floating in the same fluid nuclei and granules, with perhaps other cells, such as those which are in process of development into tissue, pus-cells, &c. Oily matter, in the form of minute globules dispersed through the mass, is also a very usual constitutent; and there are commonly found many elements not belonging to the cancer itself but to the structure in which it is produced, such as striated muscular fibre, fat, glandular tissue, &c. The blood-vessels are often of large size, and very numerous; they are generally admitted to be derived from an increased growth of the vessels naturally supplying the affected part.

It should be observed here, of the two chief elements of cancer, that they are not only intermixed in very different proportions, but that they do not invariably coexist. In some few instances the cells alone are present, being infiltrated among the tissues of the affected organ, or they may be intermixed with lymph effused in consequence of inflammation taking place in a person who is the

subject of malignant disease, or in whom the cancerous diathesis is strong. So on the other hand cases now and then occur in which a tumour, consisting only of fibrous stroma, without the intermixture of any cancer-cells, and resembling, therefore, a fibrous tumour, may exhibit the destructive and inveterate qualities of malignant disease. As a general rule, the rapidity of growth and the tendency to decay in a tumour are proportionate to the quantity of cells developed in it, they are greatest in encephaloma, less marked in scirrhus, and least marked of all in those specimens of scirrhus where the fibrous element constitutes the entire mass.

The relation which the cancerous elements bear to the natural tissues, and their effects upon them, are points of so much interest, that we must again revert to them. It is evident that at first the natural and morbid structures are, to say the least, very closely connected together. Most pathologists agree that the cancerous matter is infiltrated among the original elementary parts of the parent tissues, and occupies nearly all their interstices; that in process of time the elements of the tissues become compressed, appear to be blended with the deposit into a homogeneous mass, and gradually become atrophied and disappear. Indeed the connexion between the natural and the morbid structure is in some cases so intimate, the one being scarcely distinguishable from the other, as necessarily to suggest the idea that there may have been not merely a blending, but an actual transformation of the healthy into the cancerous tissue. This is particularly true in some of the glandular organs. In the liver, for instance, the first indication of the disease is commonly afforded by a mottled appearance, resulting from a slight discolouration of some of the lobules; they retain their proper shape and size, and their distinctness from the neighbouring lobules, but they are of white colour, and the natural components of the lobules are replaced by, if not transformed into, the elements of cancer. As the disease increases, adjacent lobules are affected, their structure is more completely altered, their individuality lost, and they are fused into one mass.

When once the cancerous change has commenced it is almost sure to spread. The assimilative energies of the morbid product are so intense that the neighbouring tissues yield under its superior force, their own nutritive powers are as it were prostrated, and they soon disappear in the same manner as the part first affected. Before being thus completely destroyed they are found in many instances to undergo certain alterations, such as atrophy or fatty degeneration, which indicate that their nutrition is impaired and that they are ready to fall an easy prey to the destructive influence which is encroaching upon them. Whether these alterations are entirely the result of that influence operating on them, though at a distance, or whether they are in part also the result of some inherent deficiency, which is the common cause both of the cancer and the atrophy, I cannot say, but am inclined to think the latter is the case. At any rate it is a common thing to find bones affected with cancer in some parts, and atrophied or greasy at others; the mammary gland, which is the seat of scirrhus, in some of its lobules is often shrunken, or loaded with fat in others; sometimes you see, as in the specimen shown you on a former occasion, a small scirrhous lump under the nipple imbedded in a mass of fat, which occupies the seat and retains the shape of the mammary gland. In like manner, when a muscle is affected with cancer, the fibres contiguous to the morbid product, are often observed to be in a state of more or less advanced fatty degeneration; their transverse markings are indistinct or invisible, their nuclei imperfect, and they are pervaded with oil. Further, although the general wasting of the body, so constantly accompanying the progress of cancer may be occasioned by pain, discharge, and various accidental causes, it must be allowed that the disproportionate quantity of fat often found in such cases, both under the skin and about the internal organs,—that fat having a remarkable deep yellow colour—is attributable to some peculiar condition of the nutritive functions dependent on, or associated with cancer.

It seems to be the general result that the higher or more organized tissues—the striped muscular, and the glandular—are commonly affected with atrophy and degeneration in connexion with cancer, and that the more simple and less organized tissues—the unstriped muscular, the cellular, and fibrous—being less amenable to the destructive influences of cancer, are often hypertrophied

or thickened by its first impression. We frequently find the two effects simultaneous in the same organ; the glandular element wasting, becoming fatty, or replaced by cancer-cells, while the fibrous element is increased to many times its natural thickness. You will not forget that the latter also does, after a time, yield to the destructive influences of the disease, being impregnated with cancer-cells, or infected with the general tendency to decay and ulceration.

When you cut open a cancerous tubercle, you will often find that, at or near the middle, it is softened or converted into a more or less diffluent pulp; and if such a part be examined more closely, it is seen to have lost all regular structure, and to be composed of fragments which appear to be the disorganized remnants of cells and tissue. The softening depends, probably, upon a failure of the nutritive powers taking place to such an extent that the component atoms are no longer held in those structural relations into which they had been thrown, and in which they had been maintained by the vital and nutritive forces of the growth. It commences naturally at the part first formed, viz., the centre of the tubercle, and is similar to the softening that takes place occasionally in simple tumours, or more frequently in scrofulous deposits and tubercles, and is similar also to the softening and disintegration of the natural structures often induced by inflammation. Though occurring in cancers, for the most part, as a regular or natural process, it may be induced by any cause which prematurely impairs their vital energies, such as an attack of inflammation or a blow. Strange and paradoxical it seems that these same products should possess such irresistible assimilative influence over the surounding tissues, and should be so unable to maintain their own existence, so liable to decay and dissolution.

The softening may commence at one or more points, and sometimes leads to the formation of several small cavities in various parts of the mass, containing a turbid fluid which often looks like pus and may contain pus corpuscles. Indeed the process frequently resembles and is associated with suppuration; the smaller cavities coalescing into a larger one which approaches the surface like an abcess, bursts through the skin and leaves an ulcer. When the cancer is situated near the skin, the softening commences on the superficial side, and takes place earlier than when it is deep-seated. This breaking up of the morbid mass is usually attended by some inflammation of the surrounding tissues with effusion of lymph uniting them together and rendering them a more easy prey to the ravages of the disease. At the same time the adjacent lymphatic glands are commonly observed to become inflamed, and to participate in the malady, if they have not before done so. It is by no means uncommon for inflammation in the surrounding tissues to precede the softening of the cancer; indeed it sometimes is contemporaneous with the earliest appearance of the disease, and attends it through all its progress so assiduously that some pathologists have regarded cancer to be only one of the multiform results of inflammation. The cavity or ulcer commencing in the manner just described continues to increase by the progressive softening and disintegration of the neighboring cancerous tissue, so that particle after particle is separated and forms a component in the discharge; the disease still advancing in the circumference while the dissolution of the mass is thus going on at the centre. In this way huge caverns are sometimes formed, and large parts of the body destroyed. Sometimes the work of demolition proceeds at a greater rate, mortification succeeds to ulceration, and considerable masses are detached. Now and then, in consequence perhaps of a slight inflammatory attack, the whole mass appears to slough away and leave a clean surface behind; but the hopes of a cure thus excited are almost always doomed to be disappointed by the reappearance of the disease in the sides of the chasm from which the slough has separated.—*Provincial Med. and Surg. Journal, Feb.* 19, 1851, *p* 85.

## 10.—POINTS OF RESEMBLANCE BETWEEN CANCEROUS AND SCROFULOUS DISEASES.

By George Murray Humphry, Esq.

[Cancer is regarded by some physiologists as a variety of scrofula. Others again imagine that tubercle is one of the varieties of cancer, but there are

certainly sufficient differences to induce us to retain in pathology the distinctions at present considered to exist between them.]

Scrofula and cancer *resemble* one another, inasmuch as both consist in the infiltration of a new exudation-substance into the interstices of the texture of a part, that infiltration being attended with a wasting or degeneration of the original tissue; both have a tendency to soften and to ulcerate, causing a loss of substance in the affected organ, and leading to more or less extensive destruction of the body; both seem to be closely associated with, or dependent upon, a want of energy in the nutritive forces of the body generally, as well as of the affected organ in particular, so that the existence of either disease at any one part, leads us to apprehend its appearance in another; both affect all the organs and tissues of the body almost indiscriminately; each presents nearly an uniform appearance in whatever region it is found; and the one is often so much like the other, that it is scarcely possible, with the naked eye, to distinguish between them.

A cancer *differs* from a scrofulous mass in its greater inherent energy of growth: its more complete organization, which is evidenced by the formation of cells, of fibres, and of blood-vessels in its substance; its more complete independence of inflammation; its power of growth, of assimilating the adjacent fluids and tissues, and in its more determined progress. The scrofulous matter, as you remember, is composed chiefly of granules, hardly ever attaining even to the cell-stage of organization, and is dependent for its increase, not on its own assimilative power, but on fresh exudation, which is commonly the result of an inflammatory condition. It often falls into a quiescent state and is absorbed: or if it softens and ulcerates the disease does not generally go on spreading in the circumference, and the ulcer for the most part heals. Such important pathological and practical differences are, undoubtedly, quite sufficient to justify the separation of these two kinds of morbid products into distinct classes.

That tubercle should be ranked with the least inveterate of these two classes—that it is the form which scrofula ordinarily assumes in the internal organs, I have already expressed my opinion. True, it is the form of scrofula most nearly approaching to cancer in its comparative independence of inflammation, and its greater fatality; but the tuberculous mass possesses no higher organization than the scrofulous; it has no cells, fibres, or blood-vessels, except those which chance to remain in it from the undestroyed tissue into which it is infiltrated, and these diminish in number and disappear after a time, so that they cannot be regarded as proper elements of the tubercle, but merely as accidental constituents. Tubercles have no power of assimilation or of increase; they are fatal on account of their numbers, not, like cancer, in consequence of the energy of their growth. Each tubercle having softened, burst, and discharged itself, has done its worst; it leaves no spreading remnant behind, and the cavity produced by it will contract and heal, provided it is not maintained and enlarged by other tubercles forming in its walls and bursting into its interior. The non-existence of any cells or other elements possessing a capability of reproduction, constitutes an important point of distinction between tubercle and cancer, connected as it is with the inability of the former to increase in size, and to exert a destructive influence upon the surrounding tissues. A cancer grows by virtue of its own inherent force; a tubercle is enlarged by some extraneous influence depositing fresh material upon it. It may, I grant, increase in size a little, but no more, probably, than is accounted for by the softening and imbibition of fluid and other changes going on in it. Moreover, tubercle very rarely co-exists with cancer in the same individual, though it is a frequent concomitant with scrofula. Indeed the ages and classes of persons most liable to scrofula and tubercle, are found to enjoy the greatest immunity from cancer.—*Provincial Med. and Surg. Journal, March* 19, 1851, *p.* 145.

## 11.—REMARKS ON CANCER.

By. Dr. P. Redfern, Aberdeen.

[Many considerations yet remain of great importance in pathology. for the complete elucidation of cancerous growths. Certain parts of the process can

be explained rationally, although not yet actually demonstrated—as the formation of a cancerous structure exuded from the blood-vessels. These conditions appear to be independent of, but to occur somewhat in the manner of those of an inflammatory nature, which pass through their accustomed stages of growth in persons who are the subjects of the most extensive cancerous infiltrations deposited from the same blood.]

In ordinary nutrition, development, and secretion, particular tissues exercise an undoubted power of election or appropriation of the various materials circulating through them, in some cases changing the arrangement of the elementary particles of these, if they do not actually form certain substances by their own immediate action; and so may an organ which has either become the seat of a cancerous deposition, or is predisposed to it in some way unknown to us, exert its peculiar elective force upon the same blood as supplies other parts with materials for the formation of healthy tissue.

The following appear among the desiderata for the perfection of our knowledge of the anatomy and pathology of cancerous growths, viz., to ascertain whether fibres exist in all cancers, and are really essential for the completion of a structure, the attendent phenomena of which shall be indistinguishable from those of cancers in general. And, whether the fibrous tissue of cancerous formation bears any constant proportion in its amount to the fibrous character of the organs in which these are developed, and is regulated by the law of analogous formations. These inquiries cannot be satisfactorily answered, otherwise than by numerous and accurate microscopical examinations of the textures of organs so affected, and especially of cancers which occur in parts that contain no fibrous tissue whatever in their normal state, and in such as contain so small a proportion of it that an increase in its quantity may readily be detected.—*Monthly Journal of Medicine, December*, 1850, *p.* 507.

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## 12.—ENCEPHALOID DISEASE.

By Dr. Charles Kidd.

It has been said encephaloid does not arise from disease of the blood; if not, it is difficult to say whence it arises. Sir Robert Carswell long since stated, that encephaloid was a molecular deposit from deranged nutrition, and our later experience has tended very fully to corroborate his views. Laennec thought it vascular; but this can scarcely be the case, as, under the microscope, we detect little else but some of the series of nucleated cells only, without the peculiar fibre of some other forms of malignant growths. The microscope has not yet succeeded in pointing out any diagnostic appearances of malignant and non-malignant growths; it has done much, however, in showing the origin of the cancer and these allied diseases.

The highly interesting fact, described by Ascherson, that a drop of oil cannot come in contact with albumen without being enclosed in a vesicular membrane—that rubbing oil and albumen together resolves them into granules identical with those found in animal fluids—that every kind of blastema deposits those elementary granules, these, united, constituting nuclei, which merely require to take place in the animal body to have the characters of vitality attached to them; the practical fact, that the molecular element is the basis of all living tissues, a view not contrary but in advance of that of Schwann, who considered, I need hardly remark, the cell as the primary form of life; the very great probability that cancer or encephaloid is not a new growth; everything, in fact, tends towards a solution of the difficult problem, what cancer really is. There is no doubt that the nuclei in cancer and cancer-like growths are produced precisely similar to those in the normal textures of the body. That there is a diminished or altered vitality of the blood plasma, is all that we can assert with any amount of certainty. The nuclei of cancer, like those of other cells, may be produced by the aggregation and melting together of molecules and granules, producing new nuclei and cells, which all microscopic observers have seen in their thousand forms, or the original nucleus may expand and we have an outer cell wall,—a new nucleus produced within it by the deposition or melting together of granules. Free nuclei, again, in a

fibrous stroma, to the young microscopist, may be still quite different, namely, the result of disintegration—of breaking down not building up of tissues, nay, both processes may even be going on together. One of the chief sources in hospital researches, perhaps of the multiplicity of cancer growths and cancer cells, is this arrest of development from constitutional causes and treatment; there are no granules distinctive of cancer nucleoli and nothing distinctive infallible of cancer cells; nothing but constant histological research and study of the history of each case, to mark out cancer cells from epithelium or pus cells. Treatment may arrest the disease, and a change in the constitution of the blood from different hygienic conditions, or from cutting out a cancer growth and thus preventing the seeds of the disease spreading, may alter the microscopic appearances; but the microscope alone will tell very little.—*Med. Times. December*, 7, 1850, *p.* 595.

## 13.—CANCER CELLS IN THE URINE.

By Mr. Balman.

[At a meeting of the Liverpool Medical and Pathological Society,]

The urine of a patient suffering from cancer of the uterus was exhibited under the microscope, and was proposed by the author as a means of diagnosticating the presence of cancer without the necessity for making an examination per vaginam. The urine washing off the cancerous discharge from the vulva, the nucleated cancer-cells were shown to the society in proof of the value of the test.—*Med. Gazette, January* 24, 1851, *p.* 159.

## 14.—OPERATIONS FOR MALIGNANT GROWTHS.

[Some surgeons strongly advise that malignant growths, under any consideration, should not be meddled with; others think the patient ought to have the benefit of a chance, and so employ the knife in a great number of these sad cases. So far as the experience of the surgeons of King's College Hospital goes, benefit does in general accrue to the patients who are operated on for malignant growths, though it cannot be denied that, in a great number of instances, a return of the malignant disease takes place.]

One of the most striking instances calculated to show these truths—viz., that malignant disease may be eradicated for a time by the surgeon's knife, and that life may be considerably prolonged, and that a recurrence of the disease is too apt, even in apparently favourable cases, to take place sooner or later, was in the hospital last year under the care of Mr. Partridge. The patient was admitted with a large fungoid tumour, which was situated in the thigh, just in front of the femoral vessels, as they run along Scarpa's triangle, and encroaching somewhat on Poupart's ligament. The size of the tumour was very considerable, being nearly as large as a man's head.

Now this patient, who was a man hardly in the prime of life, applied at King's College Hospital three years prior to this, he having at this time a large fungoid tumour, situated in the posterior part of the leg of the same side. Mr. Partridge extirpated the mass; the man recovered from the operation, returned to his occupation, and continued in health for a long period: a return, however, of the same disease takes place ultimately. The cicatrix of the old wound in the leg was perfectly healthy, and the disease was now entirely confined to the upper portion of the thigh. Mr. Partridge again operated; unfortunately erysipelas took place, and the patient died from this cause.

This case itself is an argument in favour of removal of malignant growths, when they can be entirely taken away, although the same kind of disease returned at a subsequent period; had not the original malignant tumour been taken away, it is probable that the patient would not have lived half so long as he did, and, moreover, he would have been in a state of constant pain and misery: but the operation kept him free from suffering for a few years at least, and had not an accidental attack of erysipelas carried him off after the second proceeding, he might have lived for as many years more.

It is to be borne in mind, that there was a greater likelihood of temporary success here, from the situation of the original growth, although it was a fungoid tumour: when a fungoid growth is seated in the orbit, in the substance of the testicle, or within the cavities of the nose, there is a much less chance of success after an operation, because it too often happens that similar deposits are co-existent within the internal organs, or they soon involve them; but when the growth is on one of the extremities, and a considerable distance from the trunk, there is less danger of simultaneous disease in internal organs; consequently the chance is more favourable for recovery after operation.

A case where the arm was amputated for malignant disease was in hospital at the commencement of the present year under the care of Mr. Fergusson: it well illustrates the peculiarity of malignant disease to return after a time, as well as the relief which is given by operation. The patient was a healthy-looking labouring man from Kent; and several months previous to the amputation being resorted to, he applied, in consequence of an ulcer situated on the back of the wrist: it was as large as a crown-piece, and it presented that peculiar appearance which denotes malignant action: it caused severe pain; and, moreover, it was entirely intractable to the remedial measures which were employed. Mr. Fergusson therefore removed the entire ulcerated surface with the knife, carrying the instrument well beyond the edges of the sore, so that none of the disease should be left behind. After the operation the wound rapidly cicatrized, and it was almost entirely healed up, and presented a healthy cicatrix, when the patient left the hospital. In the course, however, of a few months he returned again with a sore on the same spot, and of the same appearance. It produced considerable pain, and shortly before his application a considerable hemorrhage had taken place, which had caused the man some fear. It was very evident that it would be useless to attempt to remove the disease entirely without removing the arm as well. Mr. Fergusson therefore amputated in the forearm sufficiently high up for the flaps to be away from the disease. A speedy cicatrization of the stump took place, and the patient left the hospital in a few weeks very much improved in his health. This man lately presented himself, when it was seen that the stump of the amputated arm continued in a perfectly healthy condition, and there was not the least appearance of implication of the cicatrix in the original disease. The patient presented all the appearance of vigorous health. Just over the inner condyle of the humerus, however, is a swelling of some size, painful on pressure, and soft. This he has noticed now for some months: at first being very small and hard. It is impossible to state at present whether this is merely an enlarged and inflamed gland proceeding to suppuration, or whether it is a return of malignant disease in that situation. The hopes of the surgeon suggest the possibility of the former, but his fears lead him, not without reason, to expect that it may probably be the latter.

[The above observations apply more particularly to scirrhous tumours of the mammæ.]

The success after the excision of a scirrhous breast will depend, in a great measure, upon the period at which the operation has been performed—much, also, upon the condition in which the parts are at the time. This of course holds good not only with reference to cancer of the breast, but in like manner to the similar affections in other portions of the body. It would be useless to extirpate, with any hopes of success, a cancerous tumour of the lip, if the submaxillary glands are at the same time affected with the disease, or if the growth itself has extensively involved the mucous membrane of the mouth and gums. In like manner, no ultimate benefit can be expected if an operation should have been performed for a cancer of the penis, if at the same time the glands of the inguinal region are contaminated by the disease. It is of equal importance to select the cases of scirrhous mammæ. There will be little hope of doing good if the tumour has existed for a long time, and has become adherent to the skin above, and if at the same time the glands of the axilla are affected by the disease: but if the growth is not of long standing, is perfectly circumscribed, and the skin over it is not adherent or diseased, and if there is no implication of the axillary glands, and no symptom of constitu-

tional disease, the surgeon may operate with the reasonable hope of benefiting his patient; and, if she be willing and anxious to have it done, the surgeon is only doing his duty in acceding to her wishes in such a case.—*Med. Gazette, Dec.* 6, 1850, *p.* 989.

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## 15.—ANTIQUITY OF THE USE OF ANIMAL OIL IN SCROFULA.

In Frazer's Magazine for November, 1850, there is an interesting paper—'Leaves from the Note-Book of a Naturalist,' in which is cited a passage from Pliny, as translated in the quaint language of Philemon Holland. The passage is very remarkable, as proving how long the utility of animal oils, in scrofula, has been known. Pliny, in speaking of turtles, observes:—"If their flesh be eaten, together with the broth in which they are sodden, it is held very good for to discuss the king's evil, and to dissipate or resolve the hardness of the swelled spleen."

The naturalist also quotes an old French author, as follows:—"Labat tells us that those who go to the turtle islands, to fish for the green and hawk's-bill turtles, live on the flesh of turtles *only* for three or four months, without bread, without cassava, with nothing, in short, but the fat and lean of the animals; and he declares that, whatever maladies these men may have when they set out upon this expedition, even if they should be affected with the most loathsome, they return perfectly cured."—*Dublin Quarterly Journal of Med. Science. Feb.* 1851, *p.* 18.

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## 16.—TREATMENT OF ANASARCA, OR GENERAL DROPSY, BY PUNCTURING THE LEGS.

By Dr. C. J. B. Williams.

[At a meeting of the Royal Medical and Chirurgical Society, Dr. Williams gave the following opinion on the excretion of urea in dropsical effusions. We are aware that this opinion of Dr. Williams is very much questioned, and, among other eminent men, by Mr. Simon. Dr. Williams stated that]

When organic disease existed for a long time, not only was the circulation affected, but the secreting organs became implicated; effusion then took place, and the functions became oppressed. His attention had been much directed to this matter, and he had found in all instances of dropsy where there was much effusion of serum either in the legs or abdomen, that the fluid abounded in urea, and in some few instances contained biliary matter. In the proportion in which these abounded, was the relief afforded by puncturing. The serum in dropsy had often a urineous odour. This was chiefly in cases of renal disease, but it appeared to him that dropsy was usually ultimately connected with some functional or organic renal disease. Punctures then, he thought, afforded relief, not only by getting rid of the superfluous serum, but by purifying the blood, and removing from it those materials which were not removed by the secretory organs.—*Lancet, April* 5, 1851, *p.* 379.

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## 17.—RHEUMATIC FEVER TREATED BY ACETATE OF POTASH.

Under the care of Dr. Golding Bird.

[Many cases have been lately brought forward in which this disease has been treated with various remedies, as colchicum, acetate and nitrate of potash, and lemon-juice respectively. The treatment of rheumatic fever by acetate of potash is the more interesting as involving the truth of Dr. Golding Bird's explanation as to *why* this diuretic salt should be useful in rheumatism.]

Dr. Golding Bird, after giving a detail of the solid matters found in the urine whilst the functions are in a normal state, adds: "but we also know that the researches of Wohler have shown us something more—viz., that whatever substances exist dissolved in the blood not necessary or fit for the repair of the structure of our frame, invariably escape from the body by the kidneys. The injection of saline bodies, colouring matter, &c., readily proves Wohler's statement." The lecturer mentions a little further on, that the septic agents do not re-appear in their original form, but that they undergo

metamorphosis; and proceeds in these terms:—"Can we at will by therapeutic agents produce this depurating effect, and by hastening the metamorphosis of matter, aid the removal of a *materies morbi*, whether itself the exciting cause or effect of antecedent morbid action?"

Before we state which are the *therapeutic agents* most likely thus to depurate the blood, we should mention what efficacy Dr. Bird ascribes to the increase in the secretion of the kidneys: "It will be found that the increase of water does not escape alone, but there is really washed away with it a certain although not very large quantity of solid debris." ....."This is a key to the cures effected by mineral springs."....."I would press upon the practitioner the importance of directing his attention to diuretics, not as merely helping the pumping off of the water, but as *real alteratives*, as remedies aiding the removal from the body of injurious matter." The diuretic to which Dr. Golding Bird gives the preference for removing the *materies morbi*, in rheumatism is acetate of potash.

[The first case mentioned by Dr. Bird, was in a girl 16 years old, of sanguineous temperament, who traced her attack to sleeping in a kitchen underground. The disease commenced in the right ankle, soon reached the knee and gradually attacked the left limb as well as the shoulders.]

She was thus laboring under inflammation of the principal joints when admitted, at which period she presented the following symptoms:—skin hot and dry, tongue slightly furred; pulse quick and full, and slight headach. The wrist, knees, and ankles, swollen, stiff, and painful, and yielding a dry rubbing sound on being moved. Bowels and catamenia regular; appetite tolerable; sleep very indifferent. Dr. Bird ordered twenty-five grains of acetate of potash to be taken every fourth hour in camphor mixture, and eight grains of Dover's powder at night. The patient was much better on the third day, she moved her wrists with facility, and without pain; the skin had become moist; she slept better, the bowels acted once a day; and the appetite was improved. Pulse the same as before, and tongue more furred. The medicine was continued, and on the seventh day the ankles were free from pain, though the arms became somewhat stiff and swollen; all the other symptoms improving.

On the fourteenth day, the pulse was natural, and the patient quite free from pain in any joint: the appetite was very much improved; and to each dose of the acetate of potash hitherto regularly taken every fourth hour, four grains of ammonia-citrate of iron were added, and the girl was desired to get up for two or three hours a day. The latter injunction was carried out to a greater extent than had been prescribed, and the consequence was a slight relapse on the seventeenth day; this, however, soon gave way, and on the twenty-first day the patient was discharged quite well.

[The second case was in a married woman 29 years of age. Five days before her admission she had got very wet, and the same evening the right wrist became painful and swollen. The next day the knees and subsequently the shoulder of the same side became similarly affected.]

On admission, the right shoulder, wrist, and knee, were exquisitely tender, as well as swollen and painful; the cheeks were flushed; there was headache, and sour-smelling perspiration; tongue covered with a dirty-white fur, and red at the tip and edges: pulse quick, full and bounding; urine, turbid and acid; great restlessness, and no sleep for several nights. Dr. Bird ordered half a drachm of acetate of potash to be taken every fourth hour, in camphor mixture; and ten grains of Dover's powder at night.

The doses were somewhat larger than in the preceding case, both probably on account of the difference of age and the severity of the symptoms. As the joints were exquisitely tender, soda poultices (the ordinary linseed poultice, made with a solution of carbonate of soda, instead of plain water) were applied to the affected articulations. On the third day the patient was considerably relieved; the bowels were, however, confined. Calomel and colocynth were ordered, and the acetate continued. The improvement was steady and gradual; and on the sixteenth day all the joints were well, with the exception of a little stiffness about the shoulder. The patient then took two grains of

disulphate of quinine three times a day, and was soon quite well. The urine was in both cases considerably increased in quantity.

It will now be necessary to inquire for what reason Dr. Bird prefers the acetate of potash to other diuretics. If we turn to the above mentioned lectures, we find the following explanation :—

"Squill, copaiba, broom, juniper, &c., merely increase the fluids, and are useful in dropsy."..... "Remedies which exert no chemical action on organic matter out of the body. appear to be incapable of augmenting the quantity of solids in the urine, and hence are of use only in the elimination of water, they may and do act as renal hydragogues, but not as renal depurants."....."We have next to notice those remedies among the reputed diuretics which increase the metamorphosis of tissue, and act as *depurating agents*. This class includes the alkalies, their carbonates, and their salts, with such acids as in the animal economy are capable of being converted into carbonic acid, including the acetates, tartrates, and citrates of soda and potash. These remedies act all alike —they all actively stimulate the functions of the kidneys, and increase the bulk of the urine; but they do more—they actually increase the metamorphosis of tissue by, in all probability, a direct chemical action on the elements of worn-out and exhausted tissue or other matter in the capillary laboratory of the body."

As to nitrate of potash, Dr. Bird has found it inferior to the acetate of the same alkali. He has used the latter with much advantage, as he finds that "the quantity of fluid removed from the body by the nitrate of potash is far less than that which is carried off under the solvent influence of those agents which act more energetically on animal matter."*—*Lancet, February* 15, 1851, *p.* 177.

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## 18—TREATMENT OF RHEUMATISM BY LEMON JUICE.

By Dr. G. Owen Rees, Assistant Physician to Guy's Hospital.

[Dr. Rees is inclined to believe that lemon juice has not gained so favourable notice as it deserves. This he thinks owing to its administration in cases which experience has shewn him are but ill-adapted for its exhibition. He says :]

From the experience I have now had in the use of the remedy, I feel I have sufficient evidence before me to justify the opinion, that there are certainly two forms of rheumatic disease which cannot be benefited by the administration of lemon juice.

The first of these is generally observed in cachectic subjects, and for want of a better name I shall call it cachectic rheumatism. It occurs in all classes of life, but more commonly I believe among the lower orders. It is more frequent in females than in males. The swelling and redness of the parts affected are less marked than is generally the case in acutely painful rheumatism. The pain is, however, very severe, and occasionally partakes of the neuralgic character. The patient is sometimes anæmic, and on inquiry we may perhaps discover a history of long mental or physical suffering. The skin is perspirable; the pulse weak and rapid; the tongue varies, being sometimes moist and white, and sometimes clean and less moist than natural. In cases of this description I have not succeeded in relieving the patient by the exhibition of the juice; and if occasional relief has been obtained, the disease has shown a tendency to relapse, and become unmanageable under a continuance of the remedy. It may perhaps be well to mention, that in these cases I have derived the greatest benefit from the exhibition of opium in full doses at frequent intervals. The other form of rheumatism in which I have failed to obtain relief by the administration of the juice is that attendant on syphilis. In all the cases in which I have made trial of it among the female out-patients at Guy's Hospital, it has failed to exert any beneficial influence. The nature of the disease, so distinct from that of ordinary rheumatism, never indeed gave

[* May not this effect of acetate of potash be owing to what Mulder says of the power of acetic acid, &c., to dissolve the protein compounds. See Lancet, Feb. 15, p. 174.]

me any great hope of success. If we except the diseases above described, and cases simulating rheumatism, but really connected with ordinary dyspepsia, or, as is sometimes the case, with the existence of Bright's disease, my continued experience has but the more persuaded me of the great value of lemon juice as a remedy for rheumatism. Its action is sometimes most remarkable, causing cessation of pain and decrease of swelling and redness, such as we can rarely obtain with colchicum, even when administered in large and hazardous doses. That lemon juice sometimes fails to effect this rapidly is certainly true, and that too with respect to cases apparently identical with those in which early benefit has been observed; but the history even of these less favorable instances will generally bear comparison with the results obtained by the ordinary plans of treatment; and it is my full conviction, that since lemon juice has been introduced at Guy's Hospital as a remedy for acute rheumatism, the period during which it has become necessary to confine patients so affected to bed has been very materially lessened.

I am anxious now to direct attention to a class of chronic rheumatic cases, in which I have used lemon juice with very great advantage. I allude to such as are connected with deposit of lithate of soda in and about the smaller joints, and which partake more or less of the gouty character. I have met with great success in this form of disease by the continued use of lemon juice in combination with small doses of the tincture of the sesquichloride of iron and in several instances have effected absorption of deposits which have resisted all other plans of treatment. A case of the above description was lately reported to me, in which like success attended the administration of the lemon juice alone. The patient, a lady, had been a cripple for several years, and was eventually restored by persevering in the use of the remedy for six or eight weeks.

Lastly, with respect to the dose in which the juice ought to be administered. Experience has shown me that it should be larger than I was at first inclined to consider necessary. In acute rheumatism, from one or two ounces should be given every four or six hours; and should pain be felt in the bowels, or diarrhœa occur, which is very rarely the case, four or five minims of tincture of opium may be added to each dose of the remedy.—*Lancet*, *December* 14, 1850, *p.* 651.

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## 19.—TREATMENT OF ACUTE RHEUMATISM BY LOCAL ANÆSTHETICS.

Dr. Aran relates the results of his researches on the application of anæsthetics to the joints, in acute rheumatism. A moist compress, on which the agent is sprinkled, is applied and renewed once in twenty-four hours, being enclosed by impervious bandages so as to prevent its evaporation. It is applied to each joint in succession as it becomes inflamed. Having experimented with various agents. Dr. Aran decides in favour of the *Dutch liquid*. The relief afforded, as regards the local pain, is very decided, and lasts from one to six or eight hours according to the severity of the attack. The movement of the limbs is restored, and the swelling subsides, and the disease gradually declines in from six to eighteen days according to the duration and acuteness of the disease. The complications of rheumatism may be treated on general principles at the same time.—*Med. Gazette*, *December* 27, 1850, *p.* 1106.

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## 20.—ERYSIPELAS.

By M. Broke Galwey, Esq., Assistant Surgeon, Royal Regiment of Artillery, Woolwich.

Some of the most original and philosophic remarks that have graced the medical literature of our own country, on this disease, will be found in the No. of the 'Lancet' for March, 1844, from the pen of Dr. Arthur Wilson, of St. George's Hospital. I may say, I believe, that I have pretty nearly waded through everything that has been written, in ancient and modern literature, upon erysipelas; and I know of no author who, in a very small compass, has delivered himself of so much valuable matter upon the *natural history* of the

disorder. "Erysipelas," says Dr. W., "may be described as a *severe depressing fever*, lasting from eight to twelve days, and determined, by a special effect of inflammation, to that peculiar organic structure, the integuments of the head and face. Like other fevers, it often supervenes on any of the various causes that induce a bad state of the general health. Like the other eruptive fevers of this country, erysipelas, in bad cases, always becomes typhoid towards its close. Its pathology, by dissection, is that of scarlet fever, which, in its several stages, it very much resembles." Again: "Regarding its symptoms, whether local or general, as a train of actions *tending of necessity to their own relief*, we should in most cases, be content to watch over their safe development, and to wait patiently for the result, which, in this fever, soon arrives. Idiopathic erysipelas, within ten days from its invasion, seldom fails to cure itself." The following is a severe but just satire upon the thousand and one contrivances devised by physicians to thwart and defeat nature's efforts when oppressed by this poison:—"In our application, by treatment, of these principles to the local effects of the disease, while we are careful to protect from lasting injury the structures in which its action is most declared, we should continually remember that *in the progress of the eruption is the advancement of the cure*. It is under an imposed task of swelling, vesication, and excretion, that the skin, which bears the strain of this fever, is enabled to relieve the other vital organs, and, in the end, to maintain its own integrity. How rash and mischievous the interference that would seek to mislead the actions thus determined to the surface, by the introduction of belladonna to the system already charged with morbid poison in the blood,—that would prescribe, in all cases of the disease, an exact limit to its eruptive action, by pencilling the inflamed face and scalp with designs in lunar caustic! The mask which, in erysipelas, the patient is compelled to wear, should never be adapted by his physician!" Again, speaking of the *natural course* of some diseases, and of the fact that their *ebullitions* have a tendency to work out a "good and wholesome result," Dr. Wilson well observes—"The practical application of this principle in the treatment of disease is a continual rebuke to the vanity that would in all cases attribute the interruption or alteration of symptoms to the efficacy of the last prescription. There is no better test of the physician's general character than is afforded by his practice in erysipelas. From the rapidity with which its symptoms are developed (generally to a good end), much of the treatment in this fever is superfluous, yet much affects to be specific: and thus the boaster triumphs in a cure where the true physician is content with acknowledging a result."

There is much more in the paper from which I have been quoting that merits our serious attention. But I have done an injustice to its merits in that part of my essay where they should more appropriately have been noticed—to wit, under the head of what I had to offer upon the morbid condition of the blood in erysipelas; for the primary object with Dr. Wilson has been to establish the *constitutional* nature of this disease, having its departure, its rallying point, and, indeed, its entire essence in a blood-poison. I have reason to know that, for years before the publication of his remarks on erysipelas, Dr. Wilson had laboured at St. George's to establish the great truths of the humoral pathology; but that those labors were sneered at by some and openly ridiculed by others incapable of appreciating their importance. And it cannot but be gratifying to this estimable physician to witness the *almost rush* with which the tide of opinion is now setting in this direction. Copernicus was beaten with many stripes for asserting that the earth moved round the sun: and on rising from beneath the uplifted arm of the oppressor, he still muttered out, "*And it still moves round the sun for all this.*" Dr. Wilson was nothing daunted by those who inflicted stripes upon his adopted; and his consistent support of it ever since bespeaks the fondness with which, all along, it had lain in his bosom. Verily he has his reward.

Dr. Graves has an interesting chapter, in the second edition of his work on Clinical Medicine, upon erysipelas, with the merits of which I must detain the reader for a moment. "Erysipelas, you are aware," he says, "is generally looked upon as an inflammatory disease, and its treatment is always more or

less antiphlogistic (?) during the early stage. At this period, it is customary to treat it with general bleeding, leeching, scarifications, purgatives, mercury, and tartar emetic; and I will allow that many cases should be treated in this manner. But the gentlemen who have attended this hospital within the last three months have witnessed a form of erysipelas which required, from the beginning, an exactly opposite line of treatment. In the management of the cases which fell under our observation, no one in his senses would think of using general or local depletion, purgatives, or tartar emetic. The moment the disease appeared we were obliged to attack it with tonics, narcotics, and stimulants."

In the course of his Lumleian Lectures, the adynamic nature of erysipelas, and its immediate dependance upon a blood-poison, have been insisted upon by Dr. Todd in the most unqualified terms. Indeed, so forcibly does this eminent writer consider it a disease of low power, that he characterises "*alcohol as an antidote to the erysipelatous poison*," and treats the disorder in all cases and under all circumstances, if I mistake not (for I quote now from memory), with brandy.

Dr. Copeland describes erysipelas as "an *asthenic* inflammation depending upon constitutional disorder." Like Mason Good, he speaks of an "erysipelatous diathesis," which appears to him "to be connected with great irritability or tenderness of the cutaneous surface, and *defective power of the capillary vessels* and secreting surfaces and viscera." Among its most frequent predisposing causes he ranks "feeble leucophlegmatic and plethoric habits, unwholesome and low diet, general cachexia, and exhaustion of vital or constitutional power," &c.; and in that portion of his elaborate article on erysipelas which is devoted to the "nature" of the disorder, he observes—"The diffusive character of the inflammation, whatever tissue it may attack, is referrible entirely to defective vital power, to the changes in the circulating fluids, and to the imperfect tone of the extreme vessels; these conditions being inadequate to the formation of coagulable lymph: the products of inflammatory action in this state of vital power, and of vascular action and impurity, being a turbid, puriform, ichorous, or sanguineous serum, which produces a septic effect, or poisons the adjoining parts, especially the cellular tissue." Considering that Dr. Copland insists very strongly on the intrinsically *asthenic* nature of erysipelas, there is to my mind, some inconsistency in the terms with which we behold him flirting with the lancet in his management of the disease. "In some instances," says he, "large depletions are required; in others, moderate or local depletion only is admissible; and in many, depletion is most injurious, the most energetic tonics being often indispensably necessary." And, in speaking of the "phlegmonoid" form of the disease, he adds—"depletion and other evacuants should be prescribed with a promptitude and to an extent co-ordinate with each, and with a due regard to the circumstances of the case: always recollecting that, in diseases like this, which are connected more or less with imperfect excretion and a morbid state of the circulating fluids, vascular action may be excessive, whilst nervous power and vital resistance are reduced to the lowest states; and, therefore, that vascular depletion, in order to be salutary, or even not to be injurious, should be rarely employed, and with strict attention to its effects, both at the time and immediately afterwards."—*Med. Gazette, December* 27, 1850, *p.* 1096.

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## 21.—PURULENT ABSORPTION.

By Samuel Solly, Esq., F. R. S.

[In his valuable and interesting lectures on this subject, delivered at St. Thomas's Hospital, Mr. Solly, speaking of phlebitis, and the effect of pus on the blood, remarks.]

Pus, when mixed with the blood, coagulates that fluid, the action is not a chemical action, but a vital action. And you will at once perceive how beautifully this action is ordained by nature to prevent purulent absorption. When the vital forces retain their normal power, then the blood coagulates at once, and the wound in the vessel is sealed by a firm coagulum of blood while the

healing process is going on; but if the vital power of the blood is diminished by disease, then this conservative coagulating action does not take place in time to plug the vessel, and stop the poison at the threshold. The barrier which nature, in a state of health, erects, to prevent the flow of pus into the veins, is not set up, and the poisonous fluid is carried onward in the current of the circulation.

You must not, however, suppose that the erection of this barrier is interfered with only by disease. It may be, and often is, broken down mechanically. After bleeding in the arm, if the limb is not kept at rest, the plug is not formed, and the healing of the wound is interrupted, pus forms, and phlebitis takes place. It is true that the contractile coat of the vein plays its part also in preventing purulent absorption just as it assists in preventing hemorrhage, and if the powers of the constitution are weakened by disease or atmospheric causes, so also will the contractile power of the coats of the vein be deteriorated. But there are some veins so placed that they cannot contract on their contents, these veins are therefore dependent on this vital coagulation of the blood for their safety—I mean, the veins in bones. Hence you will perceive the immense importance of keeping the veins of a fractured limb at rest, when pus has been formed round the broken ends of the bone, and you have reason to fear the occurrence of purulent absorption being promoted by the depressing influences of an impure atmosphere or a weakened constitution.

There is another depressing agent which, I think, has not been sufficiently insisted upon: I mean, anxiety of mind. I am quite sure that mental anxiety has carried more poor fellows to the grave than any single cause that the surgeon has to contend with. I have repeatedly, and for a long series of years, observed a connexion between anxiety of mind and the formation of abscesses. I cannot offer any physiological or pathological explanation of it. I have also observed purulent absorption more frequent in patients, who, to use their own phrase, have "had something on their minds." This was certainly the case in the instance of two of the patients to whom I have adverted; I mean the man with compound fracture, and the other with fistula in ano.

You must not suppose that the veins are the only channels by which pus enters the system. The absorbents are sometimes the traitors that admit this deadly enemy into the citadel of life. There is a case now in the hospital, which on some future occasion I will relate to you in illustration of this fact.

Purulent absorption by veins has been called phlebitis. But there is this objection to the name; it implies the process is attended with inflammation of the coats of the vein, which certainly is not always the case. I do not mean to say that veins are never inflamed, or that pus is never absorbed by an inflamed vein; but I do mean, that when pus is absorbed by veins, they are not usually inflamed. I think it would be better to restrict the term phlebitis to inflammation of the vein, and use the term purulent absorption to the affection we are now considering.

I must next explain to you what becomes of the absorbed pus, and in what way it produces such mischief in the system.

The pus globules once admitted into the current of the blood, flow freely through the large systemic veins, until they reach the capillary system of the lungs. It has been stated, that in consequence of these pulmonic capillaries being more minute than the pus globule, that its progress is arrested; that they accumulate till the capillary, no longer bearing the pressure from behind, gives way, and they are extravasated into the parenchyma of the lungs. Here they reproduce their species. I doubt this mechanical explanation; I am more inclined to regard it as an attempt to excrete the poisonous matter to get rid of it from the system. I believe that this is sometimes effected, and the matter is coughed up, and the patient recovers. At the same time it must be remembered that the pus globule is a living nucleated cell, and as such enjoys an individual existence; it forms new cells, and their accumulation constitues a new abscess.

The lungs are not the only portions of the organism where this attempt to unload the system occurs. You find secondary abscesses in other situations.

In the case I am about to read to you, suppuration took place in the hand. It has been doubted if these abscesses ever occur on the other side of the lungs—that is, in the systemic arteries, unless pus has been previously effused in those organs. There are, however, several cases recorded of abscess in the liver after injuries of the head, without any mention being made of abscess also in the lungs.

Mr. Arnott collected thirty-three cases of purulent absorption following injuries of the head. In twenty-one of these, the secondary purulent deposits took place in the abdominal viscera; in five, in the thorax; in six, in the abdominal and thorax conjointly.

In one there was a deposition of pus in the substance of the heart; one, in the kidney: one, in the spleen; one, in the integuments of the back. So that you will perceive by these facts that the lungs are not the only organs where secondary purulent deposits take place.

"The general course of these cases," says Mr. Arnott, "seems to have been this, and in the great majority (twenty-four) it is so stated, that the patient for some time did well, having recovered his consciousness, when this had been lost, which was frequently not the case, was free from fever, and the wound suppurating kindly; that afterwards unfavourable symptoms took place, consisting of fevers, rigors, nausea, and vomiting, delirium, yellow colour of the skin, and sometimes, shortly before death, pain in the right hypochondrium, or affection in the chest. There was some difference in the period at which these symptoms appeared; but of nineteen cases, the earliest of which was the seventh, and the latest the twenty-fourth day, the average was between the thirteenth and fourteenth day after the accident. The average period of the fatal termination of the same cases was between the twenty-second and twenty-third days, the earliest being on the fifteenth, and the latest on the twenty-seventh, subsequent to the injury."—*Lancet, March* 15, 1581, *p.* 289.

## DISEASES OF THE NERVOUS SYSTEM.

### 22.—PATHOLOGY OF CEREBRAL AND SPINAL SOFTENINGS, AND ON THE NECESSITY OF EMPLOYING THE MICROSCOPE TO ASCERTAIN THEIR NATURE.

By Dr. J. H. Bennett, Edinburgh.

[There is some doubt about the nature of these conditions. Some consider them as the results of inflammation, chronic or acute; others think they may be induced occasionally from other causes. The main difficulty has hitherto been to distinguish one kind from another. There seems no doubt that two kinds of nervous softening are the product of inflammation, and the other arising independently of it. It is of great importance, therefore, to distinguish accurately the inflammatory from the non-inflammatory kinds.]

Inflammatory softening always contains numerous granules and granular corpuscles, which are more numerous according to the degree of softening, The nervous tubes and normal structures are always, when the softening is great, more or less broken up. The nature of inflammatory softening of the brain, like all such lesions, depends upon the exudation of blood plasma, the development of granular corpuscles, and the subsequent breaking down of the latter.

If chronic, it may be considered a fatty degeneration of the brain. When recent the serum poured out also assists in producing the softening.

In non-inflammatory softening, on the other hand, we find the cylindrical and varicose tubes of the part are rendered more soft and easily separable from each other. They have more or less lost their natural firmness and consistence, are readily torn across, the varicosities are easily enlarged by pressure, and, when separated or broken off, assume a globular form. The tubes also are more or less broken into fragments, and no exudation granules, masses, or granular corpuscles are to be detected.

The nature of non-inflammatory softening varies according to circumstances. It would seem to arise from four causes:—1st. From mechanical violence in ex-

posing the nervous centres. 2d. From a mechanical breaking up of the nervous tissue, by hemorrhagic extravasations, whether in mass or when infiltrated in small isolated points, constituting capillary apoplexy. 3d. From the mere imbibition of effused serum, which loosens the connection between the nervous tubes, and diminishes the consistence of the nervous tissue. 4th. From the process of putrefaction.

As regards the difference supposed by some to exist between the softening in adults and that in old persons, I fully agree with M. Durand-Fardel, when he says, "cerebral ramollissement is the same malady in old persons as in adults; that it presents no other differences than the modifications which a variation in age always produces, connected only with the form, and not with the nature, of the lesion."

As for the opinion, that softening of the brain is a lesion *sui generis*, due to diminution of nutrition, to gangrene, or obstruction of arteries, my observations have convinced me, that all such explanations are hypothetical in the highest degree, and have no real existence.

The cases which I have recorded also indicate that different symptoms were present in such cases as were inflammatory, and in such as were non-inflammatory. Thus, in twenty-four cases carefully examined and analysed, in which cerebral softening was observed, granular corpuscles were present in eighteen, whilst in six no traces of these bodies could be found. On analysing the symptoms of these cases, we shall find a marked difference between those accompanying the one lesion or the other. Thus in the cases where *only* inflammatory softening was present, well-marked symptoms invariably existed, such as loss of consciousness, preceded or followed by dulness of intellect, contraction and rigidity of the extremities, or paralysis. On the other hand, in the six cases of non-inflammatory softening, there was no paralysis or contraction, and no dulness or disturbance of the intellect. Again, in the four cases where both lesions were present, symptoms could always be observed in the sides opposite the inflammatory softening, while none existed opposite the non-inflammatory. An analysis of these twenty-four cases, therefore, leads to the conclusion, that the two kinds of softening we have endeavoured to establish are alike distinguishable, both by their intimate structure, and by the symptoms accompanying them during life.

Now all practical men agree in considering it a matter of extreme difficulty to reconcile, with any certainty, the morbid appearances found in the brain, with the symptoms previously observed. The future microscopic examination of the softening may serve to prevent much of the error that has hitherto been committed. For instance, softening of the fornix, septum lucidum, and central parts of the brain, may exist in two cases. To the naked eye they may be in every respect identical, and yet the microscope enables us to determine that the one contains granular corpuscles, whilst, in the other, not one of these bodies is to be found. It becomes evident, then, that previous to this distinction having been made, two distinct lesions were confounded together; and that a different train of symptoms should, under such circumstances, be occasioned, is only to be expected. Again it has frequently excited surprise, that, notwithstanding the existence of well-marked symptoms of softening, nothing was to be discovered after death. Now I have demonstrated in several instances that, although to the naked sight no morbid lesion was apparent, still portions of brain might contain the same granular corpuscles as are to be seen in more apparent lesions; and that by considering such parts diseased, all the symptoms might be explained according to the pathological laws I have previously explained. By excluding these sources of error, therefore, and by being enabled at once to distinguish the lesion dependent on inflammation from others which simulate it, we shall be enabled to obtain more exact data for future investigations. From the observations recorded, however, the two following propositions may, I think, be established.

1st. *That pathologists have hitherto confounded softening dependent on inflammation, with softening occasioned by post mortem changes or mechanical violence.* 2d. *That notwithstanding the most anxious search, and the existence during life of the most decided symptoms of softening, inflammation, though really present, has escaped observation.*

With respect to the first proposition it may be observed, that in many cases where no symptoms were present during life, extensive softening of the brain has been found after death. This is a well known fact, and is one which tends in no small degree to throw confusion on the pathology of nervous diseases. Thus, in one case there was extensive softening of the central portion of the brain, corpora striata, and optic thalami, which, however, contained no granular corpuscles. The symptoms were sudden insensibility and convulsions, which evidently depended on a capillary apoplexy that was also present. No paralysis or contraction existed. Four other cases were recorded, with more or less softening of the brain, without head symptoms, and without granular corpuscles in the softened portions.

Now in all these five cases there was an extensive softening, which it was impossible for any one to distinguish positively, by unaided sight, from inflammatory softening. In neither did granular corpuscles exist, and in neither did those symptoms occur which are peculiar to similar softenings produced by inflammation.

In addition to these five cases there were four others, where, conjoined with an inflammatory softening producing particular symptoms, there was also non-inflammatory softening, occasioning no symptoms whatever. The circumstances attendant on these nine cases, therefore, must convince us that softenings produced mechanically, or by post mortem changes, have frequently been mistaken for those dependent on inflammation, and *must necessarily be so, so long as unaided sight is made the sole means of forming a judgment with respect to their nature.*

A perusal of these cases must satisfy any one that pathologists have hitherto been confounding two distinct lesions, viz., a softening dependent on inflammation, and a softening dependent on mechanical or other causes.

The second proposition, that softening or inflammation, though present, has frequently escaped observation, is clearly established by the following facts:—

A man had paralysis, with complete resolution of the limbs on the right side, and intense rigidity of them on the left. Death occurred in six hours. On dissection, a large coagulum of blood was found effused into the left hemisphere, thus explaining the paralysis on the right side. In the right hemisphere, an old apoplectic cyst was found, and a number of small cavities, described by Dr. Sims as chronic softening undergoing a cure. Here, then, there was nothing acute—nothing to explain the intense rigidity. A microscopic demonstration demonstrated that their cavities contained numerous granular corpuscles and granules, thus proving the existence of inflammation on the right side of the brain, and explaining the rigidity on the left side of the body.

Another well-remarked case was that of a man who entered the Infirmary, under Dr. Paterson, in 1842. All the symptoms of acute softening were present; paralysis of the left side, including rigidity and contraction of the left arm, dulness of intellect, and tonic spasms of the muscles of the mouth and neck. The right side was also affected in a slighter degree. As the case excited considerable interest, great care was taken in examining the brain. When the lateral ventricles were opened, it became a question whether the right corpus striatum was softened. Several persons applied their fingers, and endeavoured to ascertain the point. As the manual examination proceeded, the normal consistence of the part diminished until at length it presented all the appearance of pultaceous softening. In this state it was shown to Dr. Paterson, who naturally enough considered it to be the result of disease. I differed from him in opinion: first, because I had carefully observed the gradual increase of the softening in the manner alluded to; and secondly, because disease of the corpus striatum, in one side of the brain, could not have explained the well-marked symptoms which existed on both sides of the body. When the pons varolii was bisected, Dr. Peacock, who conducted the examination, conceived it to be softened; others who examined it could perceive no difference in the texture; its colour and consistence were unchanged. Reasoning from the symptoms, the lesion was very likely to exist. But how, it was ar-

gued could a judgment be formed; we ought to reason from facts, not theories! Here, then, was an evident lesion of the cordus striatum, which explained nothing, and a problematical lesion of the pons varolii, which, however, did it exist, would satisfactorily account for the symptoms. In this state of uncertainty the microscope was sent for, and I demonstrated, and made evident to Drs. Paterson, Peacock, and all the students present, that the corpus striatum contained no granular corpuscles, whilst in the pons varolii they were very abundant. I have endeavoured to describe what took place on this occasion, from which it must be evident that had not the microscope been appealed to, the right corpus striatum would have been pronounced softened, whilst the real lesion in the pons varolii might have escaped observation. Under such circumstances, this case would have added another to the inexplicable observations with which the records of nervous diseases abound.

What renders these cases, and several others I could relate, so remarkable and satisfactory is, that they are not instances where the dissection was performed in a hurried manner, and by incompetent persons. On the contrary, from the particular symptoms connected with them during life, the post mortem examination was in all conducted with extreme care. The physician who had charge of this case was present. The examinations were witnessed or conducted by myself, in the presence of clerks and numerous students, and I may say that we were all in doubt until the microscope cleared up the difficulty. *These cases, therefore, sufficiently demonstrate that the naked sight is positively unable to detect lesions, even although they are directly indicated by the symptoms, and carefully looked for by experienced morbid anatomists.*

If then, the two propositions formerly stated have been satisfactorily proved, and it is agreed that pathologists have been confounding inflammatory with non-inflammatory softening, and overlooking the former, although undoubtedly present, it must be evident that many of the contradictions which have existed in connection with the pathology of nervous diseases may be accounted for. It must also be clear that no confidence can be placed in the analysis of cases, however numerous, when the sources of error now indicated have not been carefully excluded.—*Monthly Journal of Med. Science, April* 1851, *p.* 365.

## 23.—DIAGNOSIS OF DISEASES OF THE NERVOUS SYSTEM.

By Dr. J. H. Bennett, Edinburgh.

The diagnosis of these disorders is dependent on a kind of knowledge altogether different from that appertaining to the consideration of cutaneous, pulmonary, or cardiac affections. No distinct or definite laws or classifications are of such avail in the examination of nervous diseases. Some of the most fatal nervous disorders also leave, after death, no lesion detectible by the most careful examination. On the other hand, tumours and extensive destruction of the cerebral mass frequently exist without producing any effect whatever. Nevertheless, careful observation, conjoined with a knowledge of physiology and pathology, enable us to approximate closely towards, if not actually reach, in the great majority of cases, a correct opinion. Dr. Bennet first considers.]

1. *Structure and Arrangement of the Nervous System.*—To the eye, the nervous system appears to be composed of two structures,—the gray or ganglionic, and the white or fibrous. The ganglionic, when examined under high powers, may be seen to be composed of nucleated corpuscles, varying greatly in size and shape, mingled with a greater or less number of nerve tubes, also varying in calibre. The important fact with regard to these, is, that many of the corpuscles may be demonstrated to throw out prolongations, which are in direct communication with, or constitute, the central band or axis of Remak and Purkinje within the tubes.

The fibrous structure may be shown to consist of minute tubes, which are smallest towards the periphery of the cerebrum, larger towards its base, and largest in the nerves. They are of three kinds,—1st, cylindrical, as observed in the optics and auditory nerves; 2nd, varicose, as seen in the white substance of the cerebral lobes, and of the spinal cord, and 3rd, of regular size throughout, as seen in the nerves. There are also bundles of gelatinous or flat fibres,

the nature of which is much disputed, very common in the olfactory nerve and sympathetic system of nerves. There can be no doubt that some nerve tubes run into the ganglionic corpuscles, whilst others originate from them. (Wagner, Kölliker.) It is even possible that the same ganglionic corpuscle may receive and give off nerve tubes, each having distinct properties, the one of conveying the influence of impressions to, and the other of conveying influences from, the nervous centres. The peripheral termination of the nerves is in loops or arcs.

The general arrangement of the two kinds of structure should be known. By cerebrum, or brain proper, ought to be understood that part of the encephalon constituting the cerebral lobes, situated above and outside the corpus callosum; by the spinal cord, all the parts situated below this great commissure, consisting of corporal striatta, optic thalami, corpora quadrigemina, cerebellum, pons varolii, medulla oblongata, and medulla spinalis. In this way, we have a cranial and a vertebral portion of the spinal cord.

In the cerebrum, or brain proper, the ganglionic or corpuscular structure is external to the fibrous or tubular. It presents on the surface numerous fractuosities, whereby a large quantity of matter is capable of being contained in a small space. This crumpled up sheet of gray substance has been appropriately called the hemispherical ganglion. (Solly.) In the cranial portion of the spinal cord, the gray matter exists in masses, constituting a chain of ganglia at the base of the encephalon, more or less connected with each other and with the white matter of the brain proper above, and the vertebral portion of the cord below. In this last part of the nervous system, the gray matter is internal to the white, and assumes the form of the letter x, having two posterior and two anterior cornua,—an arrangement which allows the latter to be distributed in the form of nerve tubes to all parts of the frame.

The white tubular structure of the vertebral portion of the cord is divided by the anterior and posterior horns of gray matter, together with the anterior and posterior sulci, into three divisions or columns on each side. On tracing these upwards into the medulla oblongata, the anterior and middle ones may be seen to decussate with each other, whilst the posterior columns do not discussate. On tracing these up into the cerebral lobes, we observe that the anterior columns, or pyramidal tracts, send off a bundle of fibres, which passes below the olivary body, and is lost in the cerebellum—(*Archiform band* of Sully). The principal portion of the tract passes through the corpus striatum, and anterior portion of the optic thalamus, and is ultimately lost in the white substance of the cerebral hemispheres. The middle column, or olivary tract, may be traced through the substance of the optic thalamus and corpora quadrigemina, to be in like manner lost in the cerebral hemispheres. The posterior column, or restiform tract, passes almost entirely to the cerebellum. In addition to the diverging fibres in the cerebral hemispheres which may be thus traced from below upwards, connecting the hemispherical ganglion with the structures below, the brain proper also possesses bands of transverse fibres, constituting the commissures connecting the two hemispheres of the brain together, as well as longitudinal fibres connecting the anterior with the posterior lobes.

2. *Functions of the Nervous System.*—The great difference in structure existing between the gray and white matter of the nervous system, would *a priori*, lead to the supposition that they performed separate functions. The theory at present entertained on this point is, that while the gray matter eliminates or evolves nervous power, the white matter simply conducts to and from this ganglionic structure the influences which are sent or originate there.

The brain proper furnishes the conditions necessary for the manifestation of the intellectual faculties properly so called, of the emotions and passions, of volition, and is essential to sensation. That the evolution of the power especially connected with mind is dependent on the hemispherical gaglion is rendered probable by the following facts:—1. In the animal kingdom generally, a correspondence is observed between the quantity of gray matter, depth of convolutions, and the sagacity of the animal. 2. At birth the gray matter of the

cerebrum is very defective, so much so, indeed, that the convolutions are, as it were, in the first stage of their formation, being only marked out by superficial fissures almost confined to the surface of the brain. As the cineritious substance increases, the intelligence becomes developed. 3. The results of experiments by Flourens, Rolando, Hertwig, and others, have shown that, on slicing away the brain the animal becomes more dull and stupid in proportion to the quantity of cortical substance removed. 4. Clinical observation points out, that in those cases in which the disease has been afterwards found to commence at the circumference of the brain and proceed towards the centre, that the mental faculties are affected *first*; whereas in those diseases which commence at the central parts of the organ and proceed towards the circumference, they are affected *last*.

The white tubular matter of the brain proper serves, by means of the diverging fibres, to conduct the influences originating in the hemispherical ganglion to the nerves of the head and trunk, whilst they also conduct the influence of impressions made on the trunk, in an inverse manner, up to the cerebral convolutions. The other transverse and longitudinal fibres which connect together the two hemispheres, and various parts of the hemispherical ganglion, are probably subservient to that combination of the mental faculties which characterises thought.

The spinal cord, both in its cranial and vertebral portions, furnishes the conditions necessary for combined movements; and that the nervous power necessary for this purpose depends upon the gray matter, is rendered probable by the following facts:—1st, its universal connection with all motor nerves. 2d, Its increased quantity in those portions of the spinal cord from whence issue large nervous trunks. 3d, Its collection in masses at the origin of such nerves in the lower animals as furnish peculiar organs requiring a large quantity of nervous power, as in the triglia volitans, raia torpedo, silurus, &c. 4th, Clinical observation points out that, in cases where the central portion of the cord is affected previous to the external portion, an individual retains the sensibility of, and power of moving, the limbs, but wants the power to stand, walk, or keep himself erect, when the eyes are shut; whereas, when disease commences in the meninges of the cord or externally, pain, twitching, spasms, numbness, or paralysis, are the symptoms present, dependent on lesion of the white conducting matter.

The white matter of the cord acts as a conductor, in the same manner that it does in the brain proper, and there can be no doubt that the influence arising from impressions is carried along the tracts, formerly noticed, which connect the brain and two portions of the spinal cord together. It is now also determined, that many of the fibres in the nerves may be traced directly into the gray substance of the cord,—a fact originally stated by Grainger, but confirmed by Budge and Kolliker.

The various nerves of the body consist for the most part of nerve tubes, running in parallel lines. Yet some contain ganglionic corpuscles, as the olfactory, and the expansion of the optic nerve constituting the retina, whilst the sympathetic nerve contains in various places, not only ganglia, but gelatinous flat fibres. The posterior roots of the spinal nerves possess a ganglion, the function of which is quite unknown. These roots are connected with the posterior horn of gray matter in the cord, while the anterior roots are connected with the anterior horns. As regards function, the nerves may be considered as—1st, Nerves of special sensation, such as the olfactory, optic, auditory, part of the glosso-pharyngeal and lingual branch of the fifth. 2d, Nerves of common sensation, such as the greater portion of the fifth, and part of the glosso-pharyngeal. 3d, Nerves of motion, such as the third, fourth, lesser division of the fifth, sixth, facial or portio dura of the seventh, and the hypo-glossal. 4th. Senso-motory or mixed nerves, such as the pneumogastric, the accessory, and the spinal nerves. 5th, Sympathetic nerves, including the numerous ganglionic nerves of the head, thorax, and abdomen, the exact function of which has not been determined.

All nerves are endowed with a peculiar vital property, called sensibility, inherent in their structure, by virtue of which they may be excited on the ap-

plication of appropriate stimuli, so as to transmit the influence of the impressions they receive to or from the brain, spinal cord, or certain ganglia, which may be considered as nervous centres. The nerves of special sensation convey *to* their nervous centres the influence of impressions caused by odoriferous bodies, by light, sound, and by sapid substances. The nerves of common sensation convey the influence of impressions *to* their nervous centres, caused by mechanical or chemical substances. The nerves of motion carry *from* the nervous centres the influence of impressions whether psychical or physical. (Todd.) The mixed nerves carry the influence of stimuli both to and from, combining in themselves the functions of common sensation and of motion. Although the sympathetic nerves also undoubtedly carry the influence of impressions, the direction of these cannot be ascertained, from their numerous anastomoses, as well as from the ganglia scattered over them, all of which act as minute nervous centres. But there *are* cases where certain psychical stimuli (as the emotions) act on organs through these nerves, and where certain diseases (as colic, gall, stones, &c.) excite through them sensations of pain.

Sensation may be defined to be *the consciousness of an impression*, and that it may take place, it is necessary,—1st, That a stimulus should be applied to a sensitive nerve, which produces an impression; 2d, That, as the result of this impression, a something should be generated, which we call an influence, which influence is conducted along the nerve to the hemispherical ganglion; 3d, On arriving there, it calls into action that faculty of the mind called consciousness or perception, and sensation is the result. It follows that sensation may be lost by any circumstance which destroys the sensibility of the nerve to impressions, which impedes the process of conducting the influence generated by these impressions, or, lastly, which renders the mind unconscious of them. Illustrations of how sensation may be affected in all these ways must be familiar to you, from circumstances influencing the ultimate extremity of a nerve, as on exposing the foot to cold,—from injury to the spinal cord, by which the communication with the brain is cut off, or from the mind being inattentive, excited, or suspended.

The independent endowment of nerves is remarkably well illustrated by the fact, that whatever be the stimulus which calls their sensibility into action, the same result is occasioned. Mechanical, chemical, galvanic, or other *physical* stimuli, when applied to the course or the extremities of a nerve, cause the very same results as may originate from suggestive ideas, perverted imagination, or other *psychical* stimuli. Thus a chemical irritant, galvanism, or pricking and pinching a nerve of motion, will cause convulsion and spasms of the muscles to which it is distributed. The same stimuli applied to a nerve of common sensation will cause pain, to the optic nerve flashes of light, to the auditory nerve ringing sounds, and to the tip of the tongue peculiar tastes. Again, we have lately had abundant opportunities of seeing that suggestive ideas, or stimuli arising in the mind, may induce peculiar effects on the muscles, give rise to pain or insensibility, and cause perversion of all the special senses.

Motion is accomplished through the ageney of muscles, which are endowed with a peculiar vital property, called contractility, in the same way that nerve is endowed with the property of sensibility. Contractility may be called into action altogether independent of the nerves (Haller,) as by stimulating an isolated muscular fasciculous directly. (Weber.) It may also be excited by physical or psychical stimuli, operating through the nerves. Physical stimuli applied to the extremities or course of a nerve, may cause convulsions of the parts to which the motor filaments are distributed directly, or they may induce combined movements in other parts of the body *diastaltically* (Marshall Hall,) —that is, through the spinal cord. In this latter case the following series of actions take place:—1st. The influence of the impression is conducted to the spinal cord by the afferent or *esodic* filaments which enter the gray matter. 2d. A motor influence is transmitted outwards by one or more efferent or *exodic* nerves. 3d. This stimulates the contractility of the muscles to which the latter are distributed, and motion is the result. Lastly, contractility may be called into action by psychical stimuli or mental acts—such as by the will and

by certain emotions. Integrity of the muscular structure is necessary for contractile movements; of the spinal cord, for diastaltic or reflex movements; and of the brain proper, for voluntary or emotional movements.

Thus then, we may consider that the brain acting alone furnishes the conditions necessary for intelligence; the spinal cord acting alone furnishes the conditions essential for the co-ordinate movements necessary to the vital functions: and the brain and spinal cord acting together furnish the conditions necessary for voluntary motion and sensation.—*Monthly Journal of Med. Science, March*, 1851, *p.* 269.

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## 24.—PATHOLOGICAL LAWS WHICH REGULATE DISEASED FUNCTIONS OF THE NERVOUS SYSTEM.

By Dr. J. H. BENNETT, Edinburgh.

For the purposes of diagnosis and treatment, it is a matter of great importance to attend to the following generalisations:—

1. *The amount of fluids within the cranium must always be the same so long as its osseous walls are capable of resisting the pressure of the atmosphere.* There are few principles in medicine of greater practical importance than the one we are about to consider,—the more so, as many able practitioners have lately abandoned their former opinions on this head, and on what I consider to be very insufficient grounds. On this point, therefore, I cannot do better than condense and endeavour to put clearly before you the forcible arguments of the late Dr. John Reid, with such other considerations as have occurred to myself.

That the circulation within the cranium is different from that in other parts of the body, was first pointed out by the second Monro. It was tested experimentally by Dr. Kellie, of Leith, ably illustrated by Dr. Abercrombie, and successfully defended by Dr. John Reid. The views adopted by these distinguished men were, that the cranium forms a spherical bony case, capable of resisting the atmospheric pressure, the only openings into it being the different foramina by which the vessels, nerves, and spinal cord pass. The encephalon, its membranes, and blood vessels, with perhaps a small portion of the cerebro-spinal fluid, completely fill up the interior of the cranium, so that no substance can be dislodged from it without some equivalent in bulk taking its place. Dr. Monro used to point out, that a jar, or any other vessel similar to the cranium, with unyielding walls, if filled with any substance, cannot be emptied without air or some other substance taking its place. To use the illustration of Dr. Watson, the contents of the cranium are like beer in a barrel, which will not flow out of one opening, unless provision be made at the same time that air rushes in. The same kind of reasoning applies to the spinal canal, which, with the interior of the cranium, may be said to constitute one large cavity, incompressible by the atmospheric air.

Before proceeding further, we must draw a distinction between pressure on, and compression of, an organ. Many bodies are capable of undergoing a great amount of pressure without undergoing any sensible decrease in bulk. By compression must be understood that a substance occupies less space from the application of external force, as when we squeeze a sponge, or compress a bladder filled with air. Fluids generally are not absolutely incompressible, yet it requires the weight of one atmosphere, or fifteen pounds in the square inch, to produce a diminution equal to 1-20,000th part of the whole. Now this is so exceedingly small a change upon a mass equal in bulk to the brain, as not to be appreciable to our senses. Besides, the pressure on the internal surface of the blood vessels never exceeds ten or twelve pounds on the square inch, during the most violent exertion, so that, under no possible circumstances can the contents of the cranium be diminished even the 1-20,000th part. When the brain is taken out of the cranium it may, like a sponge, be compressed, by squeezing fluid out of the blood vessels; but during life, surrounded, as it is, by unyielding walls, this is impossible. For let us (with Abercrombie) say that the whole quantity of blood circulating within the cranium is equal to 10,—5 in the veins, and 5 in the arteries; if one of these be increased to six,

the other must be diminished to 4, so that the same amount, 10, is always preserved. It follows, that when fluids are effused, blood extravasated, or tumours grow, a corresponding amount of fluid must be pressed out, or of brain absorbed, from the physical impossibility of the cranium holding more matter. At the same time, it must be evident that an increased or diminished amount of pressure may be exerted *on* the brain, proportioned to the power of the heart's contraction, the effect of which will be, not to alter the amount of fluids within the cranium, but to cause, using the words of Abercrombie, "a change of circulation" there.

Dr. Kellie performed numerous experiments on cats and dogs, in order to elucidate this subject. Some of these animals were bled to death by opening the carotid or femoral arteries, others by opening the jugular veins. In some the carotids were first tied, to diminish the quantity of blood sent to the brain, and the jugulars were then opened, with a view of emptying the vessels of the brain to the greatest possible extent: while, in others, the jugulars were first secured, to prevent as much as possible the return of the blood from the brain, and one of the carotids was then opened. He inferred, from the whole inquiry, which was conducted with extreme care, "That we cannot, in fact, lessen, to any considerable extent, the quantity of blood within the cranium by arteriotomy or venesection; and that when, by profuse hemorrhages destructive of life, we do succeed in draining the vessels within the cranium of any sensible portion of red blood, there is commonly found an equivalent to this spoliation in the increased circulation or effusion of serum, serving to maintain the plenitude of the cranium."

Dr. Kellie made other experiments upon the effects of position immediately after death from strangulation or hanging. He also removed a portion of the unyielding walls of the cranium in some animals, by means of a trephine, and then bled them to death; and the differences between the appearances of the brain in these cases, and in those where the cranium was entire, were very great. One of the most remarkable of these differences was, its shrunk appearance in those animals in which a portion of the skull was removed, and the air allowed to gravitate upon its inner surface. He says, "The brain was sensibly depressed below the cranium, and a space left, which was found capable of containing a teaspoonful of water."

It results from these inquiries, that there must always be the same amount of fluids within the cranium so long as it is uninjured. In morbid conditions these fluids may be blood, serum, or pus; but in health, as blood is almost the only fluid present (the cerebro-spinal fluid being very trifling), its quantity can undergo only very slight alterations. There are many circumstances, however, which occasion local congestions in the brain, and consequently unequal pressure on its structure, in which case another portion of its substance must contain less blood, so that the amount of the whole, as to quantity, is always preserved. The circumstances are mental emotions, hemorrhages, effusions of serum, and morbid growths. Such congestions, or local hyperhemias, in themselves constitute the morbid conditions; and nature has, to a great extent, provided against their occurrence under ordinary circumstances, by the tortuosities of the arteries and the cerebro-spinal fluid described by Magendie.

The views now detailed had been very extensively admitted into pathology, when Dr. Burrows, of St. Bartholomew's Hospital, endeavored to controvert them, first in the Lumleian lectures of 1843, and subsequently in a work published in 1846, entitled, 'On Disorders of the Cerebral Circulation, and on the Connection between Affections of the Brain and Diseases of the Heart.' Dr. Burrows, however, evidently formed the most confused notions of the doctrine we are advocating; for, instead of stating it as propounded by its authors, he *actually misrepresented it*, as Dr. Reid pointed out. Thus, he is always combating the idea that blood-letting, position, strangulation, &c., cannot affect the *blood in the brain*; whereas the real proposition is, that they cannot alter the *fluids within the cranium*. By thus confounding blood with fluid, and brain with cranium, he has only contrived to overthrow a theory of his own creation.

Dr. Burrows has brought forward several observations and experiments, which he considers opposed to the theory now advocated. His facts are perfectly correct. I myself have repeated his experiments on rabbits, and can confirm his descriptions. It is the inferences he draws from them that are erroneous. For the paleness which results from hemorrhage, and the difference observable in the colour of the brain, when animals, immediately after death, are suspended by their ears or by their heels, is explicable by the diminished number of coloured blood particles in the one case, and by their gravitation downwards in the other. That the amount of fluid within the cranium was in no way affected, is proved by the plump appearance of the brains figured by Dr. Burrows, and the total absence of that shrunken appearance so well described by Dr. Kellie.

Neither does our observation of what occurs in asphyxia or apnœa, oppose the doctrine in question, as Dr. Burrows imagines, but rather confirms it. On this point the following observations by Dr. John Reid are valuable. He says, "If any circumstance could produce congestion of the vessels within the cranium, it would be that of death by hanging; for then the vessels going to and coming from the brain are, with the exception of the vertebral arteries, compressed and then obstructed. These two arteries, which are protected by the peculiarity of their course through the foramina of the transverse processes of the cervical vertebræ, must continue for a time to force their blood upon the brain, while a comparatively small quantity only can escape by the veins. Indeed, the greater quantity of blood carried to the encephalon by the vertebrals returns by the internal jugulars, and not by the vertebral veins, which are supplied from the occipital veins of the spinal cord; and the anastomoses, between the cranial and vertebral sinuses, could carry off a small quantity of the blood only, transmitted along such large arteries as the vertebrals. And yet it is well known that there is no congestion of the vessels within the cranium after death by hanging, however gorged the external parts of the head may be by blood and serum." This is admitted by Dr. Burrows, although he endeavors to get rid of so troublesome a fact by a gratuitous hypothesis, which will not bear a moment's examination, but for the refutation of which I must refer to the works of Dr. Reid.

On the whole, whether we adopt the expressions of local congestion, of change of circulation within the cranium (Abercrombie), or of unequal pressure (Burrows), our explanation of the *pathological* phenomena may be made equally correct, because each term implies pretty much the same thing. But if we imagine that venesection will enable us to diminish the amount of blood in the cerebral vessels, the theory points out that this is impossible, and that the effects of bleeding are explained by the influence produced on the heart, the altered pressure on the brain, exercised by its diminished contractions, and the change of circulation within the cranium thereby occasioned.

I have entered somewhat fully into this theory, because, independent of its vast importance in a practical point of view, it is one which originated in, and has always been maintained by, the Edinburgh School of Medicine. Singular to say, notwithstanding the obvious errors and fallacies in Dr. Burrows' work, no sooner did it appear than the whole medical press of England and Ireland adopted its conclusions, and even Dr. Watson, in the last edition of his excellent work, also abandoned the theory of Monro, Kellie, and Abercrombie. But so far is this theory concerning the circulation within the cranium from being shaken by the attack of Dr. Burrows, that it may be said now to stand on a firmer basis than ever, owing to that attack having drawn forth the convincing reasoning and unanswerable arguments of so sound an anatomist, physiologist, and pathologist as the late Dr. John Reid.—*Monthly Journal of Med. Science, March*, 1851, *p.* 273.

## 25.—EFFECTS OF STIMULUS ON DISEASE OF THE NERVOUS SYSTEM.

By Dr. J. H. Bennett, Edinburgh.

As a general rule, it may be said, that a slight stimulus produces increased or perverted action; whilst the same stimulus, long continued or much augmented, causes loss of function. All the various stimuli, whether mechanical, chemical, electrical, or pyschical, produce the same effects, and in different degrees.

Circumstances influencing the heart's action, stimulating drinks, or food, act in a like manner. Thus, if we take the effects of alcoholic drink, for the purpose of illustration, we observe that, as regards combined movements, a slight amount causes increased vigor and activity in the muscular system. As the stimulus augments in intensity, we see irregular movements occasioned, staggering, and inability of directing the limbs. Lastly, when the stimulus is excessive, there is complete inability to move, and the power of doing so is temporarily annihilated. With regard to sensibility and sensation, we observe cephalalgia, tingling, and heat of skin, tinnitus aurium, confusion of vision, muscæ volitantes, double sight, and lastly, complete insensibility and coma. As regards intelligence, we observe at first rapid flow of ideas, then confusion of mind, delirium, and lastly sopor and perfect unconsciousness. In the same manner pressure, mechanical irritation, and the various organic diseases, produce augmented, perverted, or diminished function, according to the intensity of the stimulus applied, or amount of structure destroyed.

Thus it has been shown, that excess or diminution of stimulus, too much or too little blood, very violent or very weak cardiac contractions, and inflammation or extreme exhaustion, will, so far as the nervous functions are concerned, produce similar alterations of motion, sensation, and intelligence. Excessive hemorrhage causes muscular weakness, convulsions, and loss of motor power, perversions of all the sensations, and lastly unconsciousness from syncope. Hence the general strength of the frame cannot be judged of by the nervous symptoms, although the treatment of these will be altogether different, according as the individual is robust or weak, has a full or small pulse, &c. These similar effects on the nervous centres, from apparently such opposite exciting causes, can, it seems to me, only be explained by the peculiarity of the circulation previously noticed. A change of circulation within the cranium takes place, and whether arterial or venous congestion occurs, pressure on the organ is equally the result. The importance of paying attention to this point in the treatment must be obvious.—*Monthly Jour. of Med. Science, March*, 1851, *p.* 276.

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## 26.—APOPLEXY.

By. J. H. Bennett, Edinburgh.

The term apoplexy has been used in two senses. By the older writers and clinical observers, it was used to denote a sudden loss of consciousness and volition, independent of the various morbid lesions which may occasion this apoplectic state. By the followers of the French school of pathology, the same word has been applied to an extravasation of blood into an organ; and hence the terms apoplexy of the lung, apoplexy of the spinal cord, apoplexy of the kidney, &c. Ecchymosis of the skin, the result of a contusion—such as is present in what is commonly called a "black eye,"—is in this sense an apoplexy. I believe it better to adhere to the meaning of our ancestors, the more so as it is not always possible to determine when a cerebral hemorrhage is present. Hence cases characterized by sudden loss of consciousness and volition, coming on spontaneously, are called apoplexy. But should such cases prove fatal, and we are enabled to speak positively as to the cause of the apoplexy from post-mortem examination, then we may denominate them with more propriety cerebral hemorrhage, softening, &c. &c., according to circumstances.

The treatment of such cases is to the rational practitioner, a subject of anxious consideration. The empirical practitioner has little difficulty,—venesection to a large extent being the established routine remedy. The advance of pathological knoweledge, however, must have made it apparent, that the same

proceeding is not likely to be beneficial in all cases where the nervous centres are similarly affected. We may have sudden loss of consciousness and volition from syncope, as well as from coma, the only difference between the two being, that the same nervous phenomena commence in the heart, with a weak pulse, in the one case; whilst they originate in the brain, and have a strong pulse in the other. Careful observation, however, has sufficiently proved that there are many cases of even true hemorrhagic apoplexy which are closely allied to syncope, and which have recovered under the use of stimulants, rather than of depletions. Indeed it seems to me very probable that many of those individuals who died under what Abercombie called simple apoplexy, and in whom no trace of disease could be found in the brain after death, were really the victims of one form of fatty degeneration of the heart—an affection in his day altogether unknown. The best rule, therefore, I can give you, is to judge from all the circumstances of the case. Whenever the individual is of vigorous frame of body, if the face be flushed, and the pulse strong and full, a copious bleeding will be beneficial. The extent must be influenced by its effect on the heart's action; for as we have seen, the object of this measure is not to draw blood from the brain, which is impossible, but to diminish the pressure on that organ, by lessening the force with which the heart propels the blood through the carotid and vertebral arteries. On the other hand, if the individual be of spare habit, the face pale, and the pulse weak and irregular, wine, brandy, and stimulants, and restoratives generally, are demanded. But it frequently happens that when you are called in, neither one nor the other indications present themselves. It will be most prudent, under such circumstances, to use local bleeding, apply cold to the head, administer an active purgative, and above all, enjoin quietude.—*Monthly Journal of Med. Science, March*, 1851, *p.* 279.

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## 27.—CASE OF ACUTE IDIOPATHIC TRISMUS.

By Dr. R. B. Todd, F.R.S., Physician to King's College Hospital. [Reported by H. H. Slater, M. B., Dem. Anat. K. C. L.]

The patient, Henry Franklin, æt. 40, was admitted into the Sutherland Ward on Tuesday Nov. 6th. His history was this:—On Sunday Oct. 28th, he awoke with a swollen face, and some feeling of stiffness about the jaws: he attributed this to his having caught cold by sleeping with his window open. The feeling of stiffness increased, but he was able to swallow till Sunday, the 4th of Nov., seven days after the first accession of the symptoms; and since that time he has been unable to perform the act of deglutition. On his admission (Tuesday 6th) we found him with his face very much swollen in the region of the parotids, and with considerable fœtor of his breath; and we also found, on inquiry, that he had been taking some pills with mercury (though in small quantity), in them: it is therefore very possible that he may have been one of those persons who are affected by a small quantity of mercury, and that he was in a state of salivation.

We found also great rigidity of his masseter muscles, so as to prevent him opening his mouth, and consequently, his either speaking, or swallowing. His teeth could at first be separated just so far as to slip in a card, but no farther. Moreover, we found that the effort was accompanied with great pain, which is always the case if tension is applied to a muscle in a state of contraction, as is seen in ordinary cramp, and in the treatment of club-foot: moreover, the attempt to overcome this contraction not only gave great pain, but also increased the spasm. It appeared that the muscles of deglutition were also affected, as he stated that the attempt to swallow his saliva nearly choked him.

Upon further inquiry we learned that his previous life had been temperate and sober; that he had had syphilis and secondary eruption, but no sore-throat, or nodes on his tibia or elsewhere; that he had never been subject to fits of any sort, but that he had had brain fever. This was the first day we saw him, and my apprehensions were excited as to the nature of the case: I feared it would turn out what it afterwards proved. But this supposition was very much negatived by the absence of any manifest cause for tetanus. Excepting

the exposure to cold, the slight salivation, and a small abrasion on the nose, occasioned by a fall which occurred the day before the accession of his first symptoms, there was nothing to which tetanus could possibly be assigned. The wound on the nose was very slight, and may be dismissed from the consideration at once. Cold is not an infrequent cause of tetanus in tropical climates, where the alternations of temperature are great; but it is a rare cause in this climate. I have witnessed one such case, in which the tetanic symptoms were attributed to the exposure of the patient to the open air during the whole of a very cold night. It is very possible that the exposure to the open window all night might have been the exciting cause of the disease in the present instance. Might the salivation have been the cause of the tetanus? There are on record some cases of tetanus produced by salivation. But it does not appear from the history of this case that the salivation was distinctly antecedent to the tetanic symptoms.

There was, then, a certain amount of obscurity about the case, and I was not quite prepared to act at once upon the notion that it was tetanus. I therefore adopted a treatment less decided than I should otherwise have pursued. I ordered him fomentations to the jaws and throat, an enema of starch and opium at night, and beef-tea enemata throughout the day: in fact, my treatment was very much of the expectant kind. I determined to see what the next day would produce, and contented myself with dealing with the existing symptoms.

The next day we found the symptoms of spasm still the same. The jaw was firmly clenched, and attempts to open the mouth produced great pain. He was still unable to swallow his saliva, which frothed out of his mouth at each expiration. The secretion was certainly unduly abundant. All this time he was perfectly sensible, clear, and composed. He was not at all excited in his manner; and, although he could not speak, he understood all that was said, and wrote down on paper coherent and intelligent answers to all questions that were put to him.

Here, then, we had no symptom but the local affection of trismus, which might have been the effect of the local application of cold; but my fears were that it was but the early stage of a genuine case of lock-jaw, and I stated my fears to be such. I therefore determined to try tobacco fomentation, which I had frequently seen used, and with great advantage if care is taken to uphold the strength of the patient. Tobacco has this great disadvantage,—it is a very depressing agent, and therefore tends to throw the patient into that very condition which is the most fatal tendency of the disease. To avoid this, care should be taken to use the tobacco infusion weak, or the patient may be exhausted to a degree that may prove fatal.

At seven o'clock of the evening of this day, a symptom supervened which left no doubt as to the nature of the malady: it consisted in a violent paroxysm, throwing into active contraction, not only the muscles of the jaw, but also those of the neck, chest, and back, the last producing partial opisthotonos; the sterno-hyoid, sterno-thyroid, and sterno-mastoid muscles were thrown into a state of rigidity, and this condition implicated the muscles of respiration, and so far interfered with that function, that the patient felt as if he should be choked, and jumped out of bed to endeavour to get air. This choking sensation was not caused by any contraction of the glottis, but was due to the impeded action of the muscles of respiration: in fact, the man was kept in a constant state of imperfect respiration, or rather forced expiration, the consequence of which was that the venous system was thrown into a state of great congestion,—an interesting illustration of the way in which convulsion may give rise to congestion. The pupils were very much contracted *during the paroxysm*,—a circumstance of great interest, as showing a peculiar state of the nervous centres connected with the excitement of the spasm; for, as soon as the spasm went off, the contraction of the pupils went off too; and, when the spasm was at its height, the pupils were contracted to pins' points. The pulse during the paroxysms rose to 120.

From this time the case put on a more severe form: not only the permanent contraction of the muscles and all the other conditions continued, but every

now and then one of the paroxysms would come on, each succeeding one being more severe and longer than that which preceded it; leaving the patient in a state of great exhaustion, and exciting in our minds the idea that he might be asphyxiated and die in one of them. If, however, there was any reason for such a fear, there was nothing to be done to obviate it; for, even had we performed tracheotomy, it would have availed little, for we should still have left the rigidity of the respiratory muscles unrelieved, which alone would doubtless have sufficed to produce asphyxia. But, in truth, death by exhaustion was the great thing to be feared: what we had most to apprehend was that which actually did take place—namely, that the increased frequency and severity of the paroxysms would at length produce a fatal exhaustion and that the patient would sink rapidly after one of them.

The indication for treatment was therefore to *support:* and, since it was impossible to get the patient to swallow (the attempt being immediately followed by an exacerbation of the spasm), the only alternative was, in default of one entrance, to try another. I gave him, therefore, a drachm of sulphate of quinine, in a small quantity of water, as an injection; continued the beef-tea enemata, and being anxious, if possible, to diminish the pain and spasm, I ordered the frequent inhalation of chloroform,—the plan being to give it, not in large quantities, but in small and often-repeated doses, with a large admixture of air, so as to produce a gradual and soothing effect. By this means we are able to obtain resolution of the spasmodic condition of the muscles; but to arrest the paroxysms, or diminish their strength when on him, the chloroform seemed almost powerless.

At about a quarter to twelve, A.M., on the 8th, the quinine enema was repeated: at this time he was lying in an unconscious state from the chloroform (under the influence of which he was constantly kept), with his muscles relaxed, and breathing tranquilly. About five minutes after twelve a violent spasm came on, the jaws knocked together with a distinctly audible click, the face became much distorted and livid, the eyes rolled upwards, and there was much frothing at the mouth, and great apparent difficulty of breathing, the sternomastoids violently contracted, and the head thrown forwards: in a minute or two this was succeeded by a well marked opisthotonos, the body being much curved, and resting on the occiput and sacrum. In this state he died. His death may be said to have taken place by asthenia, its immediate cause being exhaustion produced by the spasm.

There was nothing in the previous history of his patient to throw any light upon the case: he had been a sober man, had had syphilis and secondary eruption, and an illness which was called brain fever, but there was nothing to indicate any disposition to the malady of which he died—nothing, either in the man or the circumstances in which he had been placed, that could be considered predisposing to tetanus. So it is in all the cases of this disease we meet with: there is no connection between the previous history of the patient and the disease; the immediate exciting cause, and detail of the symptoms, constitute the entire history of the case.

[No morbid appearance in this case seemed to offer any explanation of the disease. On examination into the state of the ultimate structure of the masseter muscles, the result proved highly confirmatory of certain doctrines first laid down by Mr. Bowman, and remarkably illustrative of the way in which the contraction of muscle takes place.]

When a muscle is thrown into a state of contraction, that contraction does not affect the whole mass of the muscle, or even the whole of any of its fibres, at the same moment, but certain points or nodes are contracted, while the intervals are not merely passive, but are stretched by the contraction of the contracted portions; so that you have a succession of contracted points throughout the entire length of each fibre of the muscle.

[Dr. Todd makes the following suggestive observations upon this case.]

Two names are in frequent use for such affections—*tetanus* and *trismus*. I prefer *trismus*, as being more specific, localising the affection and showing its restriction to the muscles of the jaw. Tetanus is a more generic name, and indicates the general existence of tonic spasm, without any restriction as to its

whereabouts. Tetanus can hardly be called a very rare disease: trismus occurring in the adult *is* a *very rare* disease. In the present case the affection was for eight days confined to the muscles closing the jaw: only within a day of his death did it extend to the muscles of the neck and back: and not till the very last stage did it so affect the muscles of the back as to produce opisthotonos: whereas, in ordinary tetanus, the extension of the spasm to all the muscles generally occurs very early in the disease: opisthotonos may be a prominent symptom for three-fourths the duration of the attack: and, if you put your hand on the arms or legs of patients so affected, you find them hard, knotty, and rigid: whereas, in the present case, the affection was limited to the jaws: and I therefore prefer to call it trismus. The only essential difference between the two diseases is in the extent of the nervous centres, and, therefore, of the muscles implicated.

[This case illustrates death by exhaustion—it does not take place by asphyxia, nor by any particular effect on any special organ, but from general exhaustion, induced by the protracted and unwonted muscular exertion.]

These phenomena result from an exalted polarity of the centres supplying the parts affected. In the case of traumatic tetanus, the exaltation of the polar state commences in the afferent nerves of the part, that is the seat of the wound: if the tetanus arises from cold, the exalted polarity commences in those nerves of common sensation distributed to the exposed part: from the periphery thus irritated the condition is propagated through the nerves to the centres, and the effects on the muscular system show to what portions of the nervous centres the exaltation of the polar force is communicated. This, however, does not fully explain the production of tetanus; for peripheral nerves, and even nervous centres, are often subjected to great irritation without giving rise to tetanus; and it is well known that it is impossible, even by severe mutilations, to produce tetanus in the lower animals: whereas a slight accidental injury (as when a horse picks up a nail) will often produce the disease in its worst form. It would seem that some peculiar state of the system—probably some peculiar condition of the blood—is a necessary precursor of the disease. Hence, no doubt, its greater frequency in warm and unhealthy climates, in overcrowded and ill-ventilated military hospitals, and among ill-housed, and ill-fed infants.

That tetanus may be produced through the blood is shown by the results of the administration of strychnine, which exactly imitate the tetanic symptoms in every respect: so that you may at will develope the phenomena of tetanus in an animal by giving him strychnine, or injecting it into his blood, but you cannot cause it by external injuries.

The condition of the nervous centres in tetanus is, as it seems to me, best expressed by the term *exalted polarity*,—a condition which favours the undue development of the nervous force. A peculiarity of this state is, that whilst the polar state of the nervous centre is at all times exalted, it is liable to frequent fits of augmentation or exacerbation, during which more extensive effects are produced. In this way we explain the absence of any affection of the spinal cord for a considerable period, and the subsequent excitation of it in consequence of severe paroxysms affecting the medulla oblongata and its prolongations.

[Dr. Todd remarks, that perhaps he might in another case, give support a little earlier,—give a large quantity of quinine by the mouth or rectum, and, if difficulty of deglutition, throw up beef-tea enemata freely. The danger of using chloroform is, that it depresses, and therefore should be administered carefully.]

There is no good to be derived from giving those excessive doses of opium that have been used in so many cases: for, besides the negative evidence of its inutility, there is this objection to the practice—that opium given in large doses tends to call forth that very exaltation of the polarity of the nervous system which we desire to combat. This is abundantly proved by experiments on cold-blooded animals. You may throw a frog into regular tetanus by opium; and although actual tetanus cannot be produced by opium in warm-blooded animals, many circumstances tend to show that it may give rise to a state

similar to, though much less in degree, than that which it can create in reptiles.

Are we to expect any good from hydrocyanic acid? I think not: and my objections to it are much the same as those against opium—viz., that it tends to exalt, and not to lower the polarity of the nervous system. Those of you who have seen the death of an animal from hydrocyanic acid will at once appreciate this objection. You will remember the violent epilepsy—the tetanic epilepsy, if I may call it so,—the combination of tonic and clonic spasm, under which the animal suffers.

The use of galvanism has been proposed in cases of this description for the purpose of depolarizing the nervous centres, and has actually been tried by Matteucci. The long-continued passage of a current of galvanism tends to weaken and to paralyse a nerve or nervous centre, if the direction of the current be the same as that of the nervous force. In the case related by Matteucci the spasmodic condition of the muscles completely subsided during the passage of the electric current.

Another part of our treatment was the application of cold over the region of the spine. Cold has a powerful effect in depolarizing the spinal cord. I have tried it with great advantage in this hospital in tetanus, in laryngismus, and in the convulsions of children. The best plan is to fill a bladder with some broken ice, and apply it directly to the spine: an intense degree of cold may be thus obtained in a very short time, and its effect on the circulation will soon be manifest, cold having a very powerful influence in diminishing both the force and frequency of the heart's action: for this reason you must not apply it too long, or too much of it; you must watch your patient, and remove it and reapply, as his condition shall indicate. The cases in which I have tried it I have found manifestly benefited by it in diminishing the intensity of the spasms.

With regard to internal remedies, I know of nothing better than small doses of opium, belladonna, and conium. The two latter drugs certainly seem to me to have a depolarizing power, as is sufficiently obvious from their influence, especially that of belladonna, in causing dilatation of the pupil. Still, a good depolarizing agent which does not tend at the same time to weaken or depress the powers of the patient, is a great desideratum, and when discovered will no doubt prove an invaluable remedy in the treatment of tetanus. What, however, in the absence of such a remedy, the physician has principally to trust to, is, to support, in order that he may gain time to enable his patient to weather the storm, and to sustain the attacks of his disease till the source of irritation shall have ceased to exist, and its consequences have abated.

I must not conclude without calling your attention to the great importance of isolating tetanic patients, and protecting them, not only from the excitement caused by many persons surrounding the bed, but also from the influence of draughts or currents of air, or external mechanical stimuli, which are peculiarly prone to excite the tetanic spasm. These patients ought always to be put into a separate ward, and visitors excluded as much as much as possible. The temperature of the room should be kept at a moderate degree, and care should be taken to exclude sound, irregular currents of air, and light, as far as it can be conveniently done.—*Med. Gazette, November* 29, 1850, *p.* 911.

## 28.—CASE OF TETANUS IN AN INFANT.

By Dr. Nevins, Liverpool.

[This case occurred in a negro child, aged fifteen months. It awoke in the night with colicky symptoms, which excited little attention. In the morning the flexor musles of the extremities were found to be violently contracted, though the muscles of the head and trunk were unaffected, with the exception of a slight spasmodic action beneath the eyelids. He had complained of pain in walking for nearly a week, but, with the exception of a slight diarrhœa, he had otherwise seemed quite well. On percussing the spine, tenderness was found over the two lower cervical, and one or two upper dorsal vertebræ. There was no febrile excitement.]

*Treatment.*—He was kept completely under the influence of chloroform above

a quarter of an hour without the slightest effect, the rigidity continuing unabated. Three leeches were then ordered to be applied to the tender part of the spine, and a poultice afterwards. He was immersed in a hot bath, gradually raised in temperature, for above half an hour, and took *two minims* of *laudanum*, and four of spirit of sulphuric ether, *every hour*. In the evening the twitching of the eyelids had slightly increased; he had sweated profusely, and dozed at intervals, but the rigidity was not at all diminished.

Three leeches were applied to the occiput, and his head was shaved and kept cold.

Next day he was still free from pain, and intelligent; but the rigidity was not at all diminished. He showed no signs of being under the influence of opium, though he had taken about *forty minims* of the tincture. The ether had evidently produced no benefit, and the rigidity was too constant to arise from mere spasmodic contraction. The pulse was feeble, and further leeching did not appear indicated by the tenderness of the spine, but a blister was applied along its whole course. He took *four minims of laudanum*, and twenty of antimonial wine, *every hour*, with the sixth of a grain of calomel; and milk diet was given.

In the evening there was little or no amendment, but he was not worse. As there seemed to be a possibility that it might be owing to the irritation of worms, a turpentine clyster was administered, the other remedies being continued hourly.

Next day the rigidity had much abated; there were no worms in the evacuations; no signs of narcotism, though he had taken *two drachms of laudanum* in *two days*; he was not sick, and was still intelligent; the motion of the eyelids was very trifling, the blister was very sore. It was ordered to be poulticed: and the opium, antimony, and calomel were to be given every hour and a half.

The next day there was continued improvement, and the remedies were given every two hours; but the following day he was worse. The rigidity had so far abated that the feet were soft, and all the fingers could be straightened without difficulty; those of one hand remained straight, but the other contracted on removing the force: he sat up in bed, and played with flowers with one hand. To day, however, he could not do this, the rigidity having returned, though not so much as at first. The bowels were irritable and often purged, and to this circumstance I attributed the falling off. The calomel and antimony were therefore discontinued, but the laudanum, in four-minim doses, was given every hour for a few times, and then every two hours. The opinion formed seemed to be correct; for, as the bowels became tranquil the rigidity again abated, and from that time his improvement has been steady. His hands are open, and his feet soft, and the toes pliable. He can move his legs, as in walking, but can not yet (ten days after the commencement) bear his own weight. His muscles are all soft and moveable, and he takes his food and chatters as usual. All treatment is for the present discontinued, and there appears every probability of entire recovery in a few days.

About a week after this report the child was thoughtlessly taken out of the house, the day being cold, and all his symptoms returned, though in a slighter degree than before. Opium, and small doses of calomel, were ordered, and the child was clothed in flannel from head to foot. In about a week he was well again; and after an interval of several months he is still strong and healthy, though, like most negro children, very susceptible of cold.

[Dr. Nevins lays great stress upon the fact, that want of proper ventilation seems to have had nothing to do with the cause of this attack, though the reports of the Dublin Lying-in-Hospital, previous to the mastership of Dr. Collins, sufficietly prove, that an impure and close atmosphere is a sufficiently ample cause, one child in every three or four dying of trismus, or being affected by it. In this case Dr. Nevins thinks the cause must have been some inflammatory action in the theca vertebralis.]—*Medical Gazette, Dec.* 6, 1850, *p.* 981.

## 29—SULPHATE OF ZINC IN CHOREA.

(Under the care of Drs. ADDISON and BARLOW.)

[In an able paper by Dr. Hughes, published in 'Guy's Hospital Reports' for 1851, the following important facts connected with the use of zinc in the convulsive disease under consideration, are stated.]

"This metal has been more largely administered than any other. In all cases, with the exception of two, which were successfully treated by the oxide, the sulphate has been the form in which it was prescribed. The dose has been increased up to thirty-six grains three times a day. It has not often caused sickness. The stomachs of some persons, however, appear unable to bear it, even in small doses; and in others the organ rebels against the increase after a certain number of grains has been attained. Zinc was prescribed in sixty-three cases. Of these it effected a cure in forty-five, or seventy-one per cent.; it relieved in two; it failed to effect a cure in sixteen, or twenty-five per cent. In seven of the forty-five cases iron had previously failed; the zinc was given together with iron in one, and with the administration of electricity in five cases."

[Dr. Golding Bird believes that zinc has a peculiar and specific influence on the nervous matter, in about the same manner as iron has upon the blood. The first case mentioned, reported by Mr. Wood, refers to a little boy eight years of age, very weakly and strumous-looking, who was admitted into Guy's Hospital, October 11, 1850.]

About three weeks ago, whilst going to school, he was frightened by a bullock, and a few days afterwards he began to exhibit strange contortions of the body, which went on increasing in frequency and intensity up to his admission. The poor little patient was in fact constantly in motion, except when asleep. When examined, he was found very thin; skin hot and dry, and pupil dilated. The intellect was quite clear; the tongue red and injected, and protruded in a quick sharp manner, but withdrawn quietly. The articulation was considerably affected. Pulse 76, sharp, very irregular in rhythm, with systolic murmur under the nipple. Respiration very irregular in frequency; bowels open: and appetite inclined to be voracious. The involuntary muscular twitches of all the extremities are constant.

Purgative doses of mercury with soda were administered, and a few days afterwards the patient had sulphate of zinc, galbanum pill, and extract of hyoscyamus, of each two grains, in the form of pill, one to be taken morning and midday. The sulphate was increased by half grains every other day, and on the sixth after admission, the systolic murmur had decreased, and the movements were less convulsive. Wine was ordered on the fourteenth day, and on the seventeenth the patient was reported as improved in every respect; the heart's action was more regular, and the muscular contractions of the limbs hardly noticeable, except the patient became excited. On November the 3d. the twenty-second day after admission, the little boy was beginning to feed himself; the hands were getting steady, and the respiratory movements, as well as the action of the heart, more regular. On the thirty-ninth day he could almost command the use of his limbs, taking, at the time, eleven grains of the sulphate per diem; and he was discharged December the 9th, about two months after admssion, walking without any involuntary muscular contraction, and in good general health.

The notes of the second case were taken by Mr. Odling. The patient is a little boy, six years and a half old, who was admitted into Job ward, November 19. under the care of Dr. Addison. He is a child of fair, florid complexion, and light brown hair; has always enjoyed good health up to a month ago, when, having been sent to a shop with money which he lost on his way, he returned home very much frightened, and on the next day strange movements were first observed. We may mention in this place that fright has certainly a large share in the causes which produce chorea; and if we turn to Dr. Hughes's excellent paper, we find the following passage on the subject:—"*Fright.*—It appears to be generally acknowledged in the profession, and it is very commonly assumed by parents, that fright is a very frequent exciting cause of chorea. As far as the table may be trusted—and as regards the particulars

enumerated, I believe it may entirely be trusted—this very common opinion appears to be correctly founded." The patient had never had rheumatism. We are aware that this is not the place for entering upon the consideration of the connexion which has been traced between chorea, rheumatism, and heart disease; but we shall just quote, from the Guy's Hospital Reports of 1845, Dr. Hughes's opinion on the subject. "*Rheumatism.*—Next to fright, rheumatism may be regarded among most common causes of chorea. The connexion between the two diseases has been often noticed; and the frequent concurrence of spasmodic affections with pericarditis, which, in the great majority of cases, is of rheumatic origin, has been particularly illustrated by Dr. Bright, and more recently by Dr. George Burrows. It appears at least doubtful, whether, in most of such cases, there exist any thing more than a sympathetic affection of the spinal marrow, seeing that after the removal of the rheumatic affection the chorea is usually curable by the same remedies which are found available in cases of chorea having a different origin." Dr. Hughes states that from his table rheumatism was the cause of chorea in the proportion of fourteen per cent.

On admission it was found that the head and all the limbs were constantly being tossed in every direction; there was difficult articulation, but the convulsive moments were pretty similar in amount on either side of the body. The mind was clear; the boy never had a fit; the respiration was normal; the tongue clean, the appetite good; bowels costive; and urine normal. The first sound of the heart was accompanied by an abnormal bruit, and the rhythm otherwise regular, and the skin moist and supple.

Dr. Addison ordered a purgative dose of scammony and mercury, and soon afterwards one grain of sulphate of zinc, to be taken three times a day. On the third day, the dose was increased to one grain and a half, and on the tenth day the convulsive movements had considerably diminished, the abnormal condition of the heart was disappearing, the general health being very good. The dose was now increased to two grains and a half three times a day. On the twentieth day, the movements were but very slight, and the cardiac bruit had materially decreased; the patient now took four grains, at the same periods. On the twenty-fourth day, five grains were ordered; and on the twenty-sixth day after admission, the boy was discharged without a vestige of choreic movements, though there was still a slight murmur accompanying the systole of the heart.

We lately noticed in Job ward, a third case, which has so remarkably improved, that we annex a short sketch of it, from Mr. Wood's notes, though the little patient is not yet quite well. This boy is fifteen years of age, and was admitted under the care of Dr. Barlow, December 18th, 1850. He is the son of a stonemason; has been subject to ulcers on the extremities, and pains in the head, but never had a fright, fall, blow, or rheumatism. For the last six months he has been engaged as waiter, with a great deal of work up and down stairs, never going to bed before twelve o'clock. He was at last obliged to leave his situation, with pains in the back and head, and difficulty of walking. His manner was at the same time altered; he would, without any apparent cause, burst out crying or laughing, and make contortions in the face, which, with twitchings of the limbs, became worse and worse, the articulation growing indistinct at the same time.

On admission he was found to be a strumous boy, of light complexion, and vacant expression of countenance, the whole frame being affected with convulsive movements, which every second caused the whole frame to be tossed in different directions. The tongue was protruded with difficulty, and it was almost impossible to understand what the patient wished to say. The right side of the body is worse than the left, and when the boy is spoken to or looked at, the paroxysms are frightful. Appetite voracious; slight pain in the head; skin hot, but pliable; pulse frequent and irregular; tongue injected round the edges, but creamy in the centre. The patient sleeps badly, but the action of the heart and the lungs is healthy. After a smart purgative, Dr. Barlow ordered half a grain of sulphate of zinc to be taken three times a day. On the third day, this was increased to one grain; on the eighth, to two

grains, and thus the doses were increased by one grain every other day. The boy is now taking five grains three times a day, and is almost well. As he was accustomed to take much malt liquor, Dr. Barlow allowed him a pint of porter per diem.—*Lancet, January* 11, 1850, *p.* 43.

## 30.—TREATMENT OF CHOREA BY FRICTIONS WITH CHLOROFORM.

M. Gassier has published three cases of chorea cured by the topical application of chloroform.

The first was that of a child, seven years of age, in whom the disease was caused by fright. A liniment composed of equal parts of chloroform and oil of sweet almonds was rubbed, night and morning, along the course of the spine. From its first employment the violence of the muscular movements was moderated, and in six days the patient was cured.

The second case was that of a boy, twelve years of age, in whom the disease had appeared two months before as the effect of fright. The spasmodic movements were so violent that he could hold nothing in his hands, nor walk without help. At the end of a fortnight, under chloroform frictions, the disease had disappeared. A relapse, however, occurred, which was cured in two days by a return to the same means.

In a third case, of five month's standing, the result also of fright, the symptoms disappeared in seven days under chloroform friction.—*L'Union Médicale, October* 31, 1850.—*Med. Gazette, November* 15, 1850, *p.* 866.

## 31.—CONVULSIVE DISEASES.

By Charles Bland Radcliffe, Esq., M.B.

*Of the Convulsive Attack.*—1. Beginning with the more simple and familiar phenomena of morbid muscular action, it is not difficult to obtain some light as to their efficient causes. Every one knows, indeed, how the teeth will chatter, and the limbs shake, when he undresses in a cold room, or goes out without sufficient clothing on a winter's day, and how much more likely these symptoms are to happen when faint and hungry from want of food. Every one knows, also, how sudden grief or alarm will of themselves bring on these movements, and how joy will nerve the frame, and make it indifferent alike to the want of food and the inclemency of the weather. In short, it is a matter of ordinary experience, that this occasional trembling of delicate persons is induced by causes which depress the system.

Nor is it less certain that elderly people are more affected by tremulousness in winter than in summer, or when kept waiting for a meal; or when startled or distressed in any manner; so that in this case also the movements would seem to betoken the withdrawal of a stimulus.

Again, it is difficult to suppose that the muscles are more vigorously excited in the moment of dissolution, or in the state which follows, than during life; so that we seem obliged to conclude that death struggles and *rigor mortis*, like the more insignificant movements of which we have just spoken, are determined by some lowering of the vital energy.

2. The appearance of any one during an attack of hysteric convulsion betrays no excitement, but, on the contrary, it is rather the death-like paleness of a person in a swoon. This, indeed, is what might be expected from the nature of the causes which determine the fit, for these, without exception, appear to be those which depress the system. It is altogether different with those paroxysms of hysteria, in which there is raving and violent volitional action of the muscles, for here the system evidences high excitement, and the determining causes are such as are likely to induce this state: but when the attack is marked by convulsion, I believe we may seek in vain for these signs and causes of activity.

The appearance of any one during a paroxysm of chorea is equally against the hypothesis of excitement, and so also are the circumstances which lead to this paroxysm. Indeed, with few if any exceptions, we find that the immedi-

ate antecedent has been some exposure to cold, some sudden fright or unexpected trouble, or some abstinence from flesh and wine, the abstinence itself being often the reflex of a fit of mistaken asceticism.

We find, indeed, so far as we may judge from the imperfect evidence which belongs to this part of our subject, that whatever induces or aggravates ordinary tremulousness, would seem to have a like influence in hysteric convulsion or choraic agitation.

3. In an epileptic attack, the pulse at first is weak, irregular, and much slower than natural, and in some instances the action of the heart is suspended altogether. The face also is pale or dusky. the skin cold and clammy, and not unfrequently there is shuddering, with a marked disposition to faintness, or actual fainting. Then the symptoms undergo a rapid change, and the countenance becomes livid and injected, the eyes are bloodshot and half-starting out of the sockets, and the integuments of the face, head and neck, distended in a very remarkable manner; and, lastly, the blueness and turgidity of this asphyxiated state pass off, and the circulation again exhibits the signs of collapse and prostration.

In this attack we find, also, that the convulsion is less violent and protracted in persons who approach most nearly to the sanguine habit, than in those in whom the face is pale and sallow, and the pulse small and weak; and this is further borne out by the fact, that the succeeding collapse is in direct relation to the severity of the paroxysm.

There are, undoubtedly, fits in which there is high vascular action; but these are of an apoplectic character, where coma, and not convulsion, is the dominant symptom. So far, indeed, from this being the case in pure epilepsy, it would appear as if the left side of the heart were inactive, and the arterial system almost empty,—if, at least, we are to judge from the extreme feebleness or complete suspension of the pulse at the wrist. Moreover, I am satisfied, from repeated observations, that the tumultuous throbbing in the neck, which is often cited as strong pulsation in the carotids, is in reality the reflex of the action of the right ventricle in the jugulars and neighboring veins, the reflex itself being due to that half-open state of the auriculo-ventricular valve which is brought about by the asphyxia before mentioned.

When, therefore, we consider this evidence of suspended arterial impulse at the commencement of the fit, asphyxia during its continuance, and collapse at the close, together with the fact that the violence would seem to be in direct relation to the bloodless condition of the system, we can scarcely do otherwise than conclude that the attendant change in the vascular system is marked by reduction and not by exaltation of the normal energy.

Nor is it different with the nervous system, as we may, indeed, infer from the state of the circulation. At first the face is pale, and it is not until the fit has lasted some time, and the patient is partially asphyxiated, that it becomes injected, tumid and livid; nay, even in the cases which are ushered in by fainting, (and these are not unfrequently the worst of all,) this paleness may continue throughout. So far as the face is concerned, (and this is a proper index of the state of the circulation within the head,) there is no evidence, therefore, of an excited state of the brain. And, as this depression extends to the entire vascular system, it follows that we must draw a similar conclusion in reference to the state of the spinal cord and other nervous centres. It is equally evident, also, that the congestion which is subsequently set up in these several centres, in consequence of the asphyxia, is not the cause of the fit; for, as Foville first remarked, the fit precedes any muscular fulness, and passes off when the congestion is at its height.

There is, however, direct as well as indirect evidence that the nervous energy is not exalted. Thus, in the majority of cases, there is no mental excitement before the fit, and in the rest the existence of such a state is extremely problematical. Generally epileptics sit or move about in a moping or listless manner, and fall down at once without any premonition, and even when more animated, the attack for the most part is not less unexpected. And where there is any warning this is generally a mysterious creeping and chilly feeling, analogous to, and often undistinguishable from, that which ushers in the initial

shudderings of febrile disorders; and, therefore, if we may judge from this collateral consideration, it is a phenomenon which indicates a state the very reverse of excitement. In other ways, also, the history of the attack exhibits the want of nervous energy. Consciousness is completely lost,—and hence we must suppose the part of the brain concerned in the manifestation of this attribute to be inactive. Sensibility is suspended,—and it is necessary to draw a similar conclusion in relation to the region devoted to this function. And this being the case, it is not easy to suppose an exception as to the rest of the nervous system; at any rate we may refuse, in the evidence which has preceded, to admit the presence of involuntary convulsion as a sufficient proof.

That there is a general prostration of the nervous energy, may be argued also from other considerations. It follows, indeed, from the state of the circulation. for this involves depression of the entire bodily powers. It follows, also, from the absence of any constant signs of vascular activity among the appearances presented on death. There are in many instances undoubted proofs of active mischief, but these are to be met with where epilepsy has been complicated with mania. We may argue, moreover, that these signs are accidental so far as the epilepsy is concerned, and that the very opposites belong to the disease: and this both because the convulsive seizures occur more rarely and are less severe in their character in the maniacal patients, and because they are more frequent and violent in cases where the mind is fatuous rather than excited, and where the nervous system presents a pallid or venous appearance, with atrophy of the substance, and superabundant serosity. Do away, indeed, with non-essentials, (and the traces of mania must be ranked in this category,) and the only appearances we can detect in the nervous system are those which indicate defective functional activity during life, and these general and not local. What we find, indeed, is like unto that which supervenes naturally in advanced life; and the fact, that convulsive movements are associated with senile degeneration, is one of the many proofs of the correctness of this observation.

In relation to the antecedents of the fit, it is the same with epileptics as with persons subject to hysteria or chorea. Thus, it is not joy, but fear or fright, to which the seizures are referred; it is not to the temperate indulgence of the appetite, but to excess and abuse, with the exhaustion consequent thereon; it is not to a good meal, but to the want of it. Indeed, in many scores of cases in which I have examined minutely into the history of the attack, I have not been able to find a single instance in which the patient did not indicate some or other cause, the direct or indirect operation of which was to depress the vital powers.

So far as we can see, therefore, the accompaniments and antecedents of the epileptic attack indicate prostration and collapse; and thus this formidable malady would seem to ally itself with the simpler and more familiar conditions of convulsion which have already occupied our attention.

4. No signs of excitement are attendant upon the rigors or convulsive movements which usher in febrile affections or true fevers; and not only so, but there is positive evidence of actual depression, both of body and mind. It is evident also from the history of cholera, that the severity of the convulsion is in direct relation to this depression; and this conclusion is in perfect accordance with the history of the last stages of fever; for in this case we find that the subsultus, which made its appearance when the powers of the system began to fail, is exaggerated into convulsive struggling at the time of death.

Here, also, we cannot well suppose any focus of energy in the shivering or convulsed patient from which an excess of motive influence is supplied to the muscles; indeed, the evidence of any primary local affection is altogether wanting. Inflammation, or some similar disturbance, may arise in the progress of the malady, and this may be in the brain or elsewhere; but, as this is not constant in its occurrence, or in its locality when it does occur, and as it is obviously secondary in point of time, it is evident that it cannot be essential to the convulsion.

Analogously, we may argue as to epilepsy and the allied maladies; and we suppose that any local affection, however much they may increase the liability

by aggravating the weakly state of the system, are, nevertheless, not essential to the malady itself. And not only so, but as, in the cases under consideration, we find that convulsion is incompatible with vascular excitement, so we gain additional confidence as to the correctness of what we have advanced when speaking of chronic convulsive maladies.

5. During a fit of catalepsy the appearances are so peculiar, that it is scarcely possible to avoid the conclusion that the contractions in the muscles are the anticipation of those which happen after death. Every circumstance indicates that life is upon the very verge of extinction, and the patient, to use the words of Dr. Watson, "looks like a waxen figure, or an inanimate statue, or frozen corpse."

In tetanus, also, there is no reason to suppose excitement necessary to the attack, but rather the contrary. Indeed, the fact that this happens for the most part unexpectedly, and without any warning, after a preliminary stage of depression, together with the fact, that the spasms are often unabated when the vital energy is well-nigh extinct, may be considered as arguments which tend to show that the accession is at a time when the system had become depressed to a certain point.

It is the same also with *rigor-mortis;* for in this case the accession is immediate if the strength has been previously worn away by an exhausting disease like fever, or by the slower waste of consumption or old age; but it is deferred for a long period, often for days, when a person has been cut down in the full vigour of health. In other words it would seem as if this peculiar rigidity were resisted by the lingering vitality of the system.

6. We need say little upon the mode of attack in those vaguer forms of convulsions which do not come under any of the former heads. There is nothing, however, which is not in accordance with what has been said. Indeed, a chief argument in favour of all is to be found in the epileptoid convulsions, which depend upon hæmorrhage; for in this case it is impossible to doubt that the immediate and only cause is unmodified exhaustion.

7. In conclusion: the lesson to be deduced from these considerations is, that the *convulsive attack* is accompanied, and, so far as we can judge, determined, by a depressed state of vital energy. At any rate we must admit the absence of all proof that it is dependent upon an inflammatory or congestive state of the system, whether partial or general.—*Med. Times, April* 5, 1851, *p.* 370.

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## 32.—FUNCTIONAL PARALYSIS.

By Edwin Lee, Esq. [Read before the Medical Society of London.]

After alluding to the difficulty of diagnosis between functional and structural paralysis, and also between cases of functional paralysis arising from causes of centric and eccentric origin, Mr. Lee observes, that a not unfrequent origin of hemiplegia or partial paralysis, which has been considered as depending upon congestion, effusion, or structural change in the brain or spinal cord, is a deficiency of due cerebral excitation, either from an imperfect supply of arterial blood to the brain, from causes of an exhausting or depressing nature, mental or otherwise, by which the faculty of volition is directly affected, and, in some instances, from original or long-continued inactivity of parts, in consequence of which the conducting powers of the nerves are impaired. As illustrations of these local paralysis Mr. Lee cited dumbness in cases of congenital deafness, the slowness of speech in idiots, the destruction of life by what is termed nervous apoplexy, as an example of the highest degree of exhaustion or deficiency of nervous power, no pathological change being found at the autopsy. the utter absence of structural disease in numerous cases of paralysis, as ascertained by M. Lebert, physician to the Bicetre, and the occurrence of death, or of a privation of power in particular parts, from mental emotions, such as joy, fright, &c.—parts which, though employed in the performance of ordinary actions, or whose actions are more complicated, and require greater exertion of volition for their healthy performance, are necessarily more liable to be affected by whatever impairs the integrity of the faculty than those which are

directly controlled by the will, and have a more simple office. Thus the muscles of the larynx, pharnyx, of the bladder, and the spincter ani, are more subject to loss of power from mental emotion, as in the instance of temporary privation of speech, and inability to retain the alvine contents, &c., from fear, than are the flexors and extensors of the extremities. In states of nervous weakness, or paresis, from whatever cause, flexion and extension of the limbs are much more easily performed than rotation inwards or outwards; the inferior extremities are more frequently affected than the superior, whereas the muscles of the tongue and of the face, deriving their nerves directly, and without any long *trajet*, from the central organ, are affected only in extreme cases, as regards their more simple movements. The symptoms may, however, be determined to particular parts by injuries or other local causes; these are exceptions, however. These complaints are often intractable, and but little relieved by ordinary remedies, in consequence of their peculiar nature and causes not being in general sufficiently considered. Where the remedial means are chiefly directed against the mere symptom of loss of power they will mostly fail. The patient's attention being concentrated upon the complaint, it is very often kept up by habit alone for months or years, till some circumstance or other occurs to break the chain, by exciting the faculty of volition to action. To such a change, the author referred the supposed curative power of charlatans and miracle-mongers, and, in illustration, cited the case of a young female, paraplegic for years, who was cured of her disease by immersion in the Ouse, under the superintendence of a clergyman. This, like many similar cases, the author observed, had, in all probability, been treated in a mere routine manner, and may suffice to indicate that these complaints, especially when of long duration, are more likely to be remedied by circumstances which divert the patient's attention from their consideration by mental agencies, tending to excite the torpid volition, or by any means by which the patient can be induced to have confidence; the apprehension of a painful or disagreeable application, as, of the actual cautery, or of blisters, has sometimes a beneficial effect; whereas, the excessive sympathy of relatives and friends, the too minute attention on the part of the practitioner to particular symptoms, and a purely pharmaceutical mode of treatment, will invariably tend to retard recovery.

[Dr. Forbes Winslow objected to the term functional, according to the signification attached to it by the author of the paper. He could not conceive how any function could be disordered *per se;* it must be, in obedience to recognized physiological laws, invariably the immediate consequence or effect of an altered physical condition of organic matter.]

He (Dr. Winslow), thought that every action of the nervous fibre or tissue was associated with, or the immediate result of, a molecular change in the part. Such was the particular condition of the *motor* nerve, when volition was transmitted from the sensorium to a distant portion of the body, and of the nerve of sensation when impressions were conveyed from remote parts of the frame to the great nervous centre. He argued that there existed a healthy or normal function of a nerve, to which physiologists applied the name "molecular;" and that any deviation from the natural healthy or normal function of the nerve must be either the direct effect of, or be invariably associated with, an abnormal condition of the molecular action. In paralysis, however trifling in its character, he thought there was always some deviation from the healthy and normal condition of some portion of the nervous tissue. This deviation or change often escaped the most minute microscopic examination. Changes often took place in the delicate structure of the vesicular matter—particularly of the nucleated nerve-vesicles, which set at defiance the careful scrutiny of the pathologist. Paralysis often depended upon a minute alteration in the arrangement of the nervous fibres—a slight effusion in the sheath of the nerve, or an affection of the nervous pith, or congestion of the delicate tissue of the nerve-tube, or vesicle, or cell. Again: paralysis, and other affections termed nervous, might be the result of some modification of the *vis nervosa* itself. The "nervous fluid," or "energy," or "force," as it was variously designated by physiologists, we had every reason to believe to be a blood-product. Any

altered condition of the blood, any important change in its vital properties, would, as a matter of course, modify, and materially alter the nature and condition of the nervous fluid itself, admitting it to be a secretion from the blood. A large quantity of blood was sent to the vesicular portion of the brain, where we had every reason to believe the nervous force to be generated. May not paralysis and other disorders of the nervous system be connected with a modification or unhealthy condition of the nervous energy itself, consequent upon a vitiated state of the blood? Poison circulating in the blood, like that of lead, would derange the action of the nerves, and give rise to paralysis. The nerves themselves were susceptible of organic change, such as atrophy and hypertrophy. In long persistent sciatica, and in neuralgic affections of other nerves, an atrophied condition was occasionally detected after death. He argued that we were not justified in asserting that no pathological or organic change hadtaken place in certain nerves, whose functions were greatly disordered, unless the most minute examination was made into the weight of the brain, its alterations in colour (often the indication of organic mischief), or chemical and anatomical character of the different nervous tissues. He had no doubt that the modification or change in the nervous matter, inappreciable to the naked eye or the microscope, indicated by what is called "functional" disturbance of the nervous system, was frequently owing to some altered state of the chemical constituents of the nerve-fibre or vesicle. He instanced the effect of the presence or absence of phosphorus in the brain, asserting that in early life it existed in its minimum extent; in the middle period of life, when great activity of mind was exhibited, it was found in larger quantities; and in old age and idiocy, the smallest portion was detected in the cerebral matter. In states of great mental depression, he thought the normal proportion of phosphorus was lessened. The pathology of the brain, in cases of paralysis, was involved in considerable obscurity. Physiologists had succeeded in establishing, by means of experiments and careful pathological inquiry, the special function of certain portions of the brain. It was generally admitted that no effusion or extravasation could take place either in the *corpora stratia* or *thalami* without the immediate effect being paralysis. In considering the subject under discussion it was important to diagnose successfully between *cerebral* paralysis and *spinal* paralysis, and those affections of the afferent and efferent systems of nerve which commence in the periphery of the nerves themselves, and are termed circumferential. In forming a diagnosis, it was most important to keep in recollection certain important and well-established physiological axioms. To Dr. Marshall Hall the profession was greatly indebted. This distinguished physiologist, after careful and patient investigation, had established, that in cerebral paralysis, when the influence of the brain is removed, there is always to be found augmented irritability, with increased tonicity of of the muscular fibre, emotional influence remaining nearly intact. In spinal paralysis the influence of the brain, as well as the spinal marrow, is removed. Under these circumstances there is diminished irritability, as well as a diminution of muscular tonicity. In paralysis commencing in the remote expansion of the nerves, often extending to the brain itself, it was generally discovered that sensation was more affected than motion. By keeping these important physiological truths in mind, and connecting them with the early history of cases of paralysis, the physician would, even in cases apparently obscure, find little difficulty in forming a successful diagnosis between those lesions of motion and sensation which respectively have their origin in the brain, spinal marrow, or in the periphery of the nerves. He directed the attention of the Society to a form of mental disease which had not sufficiently attracted the attention of the physician. He alluded to a morbid condition of mind connected with a sudden loss of all power over the train of thought. This state was distinct from insanity, there being no aberration of the idea, and it was also, in its pathological character, different from dementia, or that loss of mental power generally connected with softening of the brain. He termed it mental paralysis. Without any apparent cause, or the existence of precursory symptoms, the patient, whilst engaged in conversation, suddenly has his ideas completely paralyzed. This was generally temporary in its duration. He thought it as-

sociated with an anæmic condition of the brain, and a non-fibrinous state of the blood. and was to be cured by rest, and the exhibition of mineral and metallic tonics. The speaker made some remarks in conclusion on the necessity of using with extreme caution depleting remedies in cases of paralysis, and considered that most forms of cerebral disease, particularly those connected with mental derangement and paralysis, were combined with an exhausted condition of the nervous and vital energies.—*Lancet, Jan.* 11, 1851, *p.* 45.

## 33.—PARALYSIS AGITANS.

[The following article is from one of the original communications published in 'The Institute.']

Paralysis Agitans is emphatically a disease of emotion. Emotion is its first and last cause; without emotion it would never be called into existence, or being once induced, it would never manifest itself. This at least is true, of its first phase; whether any physical lesion may supervene in its protracted course, remains a deeply interesting question. In one case, paralysis agitans arose from the irreparable loss of a bereaved wife. In another, it was induced by the mortifications and vexations arising out of a disputed election. In its earlier stage, the peculiar symptom of this disease is seen, or most seen under every circumstance of emotion, but ceases whenever emotion ceases, or whenever this is superseded by an energetic act of volition, or by a firm act of resolution.

Alone, reposing, asleep, the agitation is absent. It is renewed when cause of emotion comes into operation. It frequently subsides in the society of the patient's immediate relatives or friends, as his wife and children, and is re-exerted on the appearance of a visitor, or a stranger. It is especially apt to be renewed on the appearance of certain persons whose presence or conversation recall agitating ideas; in one case, the presence of the patient's keeper, agent, or physician, had the most marked effect in inducing the agitation and shaking, the conversation with those persons being the most attended by emotion.

I have said that the shaking is produced by a fresh act of volition. If the patient firmly extends the arm and hand, and firmly retains it in its new position, all shaking ceases; but the agitation returns as the force and firmness of the volition subsides, and the patient, with less firmness and volition draws back his hand. The agitation ceases too for a short time, if by firmness of purpose the hand is allowed to pass on to inaction,—to fall on the knee, for example. The symptom subsides, in a word, when its cause, emotion, is superseded by an another and an energetic idea.

But we live, unconsciously almost (and infinitely more than is generally supposed), a life of emotion. Every moment brings its agitating thought, every day brings its anxious care. But in the disease in question, there is by original temperament, and in induced morbid excitability, augmented susceptibility to its influence; and events, which, in health, induced no manifestation of their power, become obvious in their peculiar effects on the nervous and muscular systems.

The peculiar shaking, and the equally peculiar powerlessness, or shall I call it paralysis, cease on giving *confidence* to the patient. I may here adduce an anecdote:—A gentleman, a magistrate, confined to his chair by paralysis agitans, wished to consult a legal book. He asked for it, and his servant gave it to him, as he supposed. On opening it, he found it the wrong book. In his anger he rose from his chair, and reached it himself. Surprised at discovering his power of walking, he endeavored to repeat the experiment, and, remembering that before he had risen from his chair, he had rather violently closed his book, he repeated this manœuvre, and ever since, on doing this—but only on doing this—he regains his power of walking.

One patient could walk whenever he pleased, with the tips of his fingers merely on his wife's arm, but not otherwise.

All the movements of the patient afflicted with paralysis agitans are quick and energetic; his walk becomes a run: his power consists in an *energetic* volition.

It is essential to replace a (unfounded?) conviction in the patient's mind, that he is powerless, by another, viz., that he really possesses power, the circumstances being changed. The prepossession—the depressing emotion must be removed, and replaced by an emotion of the opposite kind.

In speaking of emotion as the cause of paralysis agitans, we ought to notice that this emotion is of the painful and agitating kind, and not unallied to fear and vexation. The elevating emotions or mental states, as hope, confidence, energy, have a marked beneficial effect. The movements made with firmness and resolution are always least attended by agitation.

There is, in consequence, a disposition in this malady, to rapid movement. The patient is apt to *run* instead of walking deliberately. An energetic volition overcomes the influence of emotion; volition of less energy is more or less defeated by emotion in its turn.

At first the head and the arm or arms are more or less affected; afterwards other parts and limbs are involved in this dire malady. At length the power of the lips in articulation, of the fingers in writing, in dressing and undressing, and in using the knife and fork, of the muscles which support the head, of the pharynx, of the rectum, of the spinctures, &c., becomes diminished. At length, too, there is agitation during sleep, which is apt to be disturbed by the movements. Or it may be, that disturbed sleep or dreams—the emotion of sleep—may add to the agitation of the head or limbs, which may, in its turn interrupt the sleep.

The extraordinary fact in regard to paralysis agitans is, that though it consists in undue excitability of the spinal centre, this undue susceptibility, as it is caused, so it is affected by emotion and emotion only. This susceptibility does not extend to the centre of the diastaltic actions. In this respect, as in its chronic character, it differs from tetanus, whilst it agrees, though not in its causes, with chorea.

It is singular that emotion being the cause, the seat of the emotion, the seat of the disease, the heart and other organs so constantly under the influence of emotion, is not more affected.

The paralysis agitans has hitherto made an exceedingly slow, but not the less fatal, progress.

Unfortunately, we possess no *post-mortem* examinations of this disease. I suspect no morbid lesion would be detected. No such lesion, hitherto known, would lead to the peculiar phenomena of this malady, except towards its close, when a sort of general paralysis takes place, which may be the effect of effusion and consequent pressure. I ought not to pass by unnoticed the 'Essay on the Shaking Palsy,' published in 1817. Mr. Parkinson seems to have had no idea of the real cause of this disease. He made no *post-mortem*, and the case of Count de Lordat, in which a *post-mortem* was made, was a case of accident, and not of shaking palsy; the patient "was as capable as ever of writing, and, indeed, presented no pathognomonic symptoms of that disease." Still Mr. Parkinson's essay is one of great merit and originality.

As emotion is the original and the continued cause of this trying malady, an important question arises,—What would be the effect of a sustained removal of all sources of emotions, if, and when this may be possible?

As in cases of undue susceptibility to light, we place the patient in a room, from which every beam of light is excluded, why should we not remove the patient afflicted with paralysis agitans from every source of emotion—and this for a sufficient time to allow undue excitability to subside, and to give a sufficient opportunity for the administration of remedies?

Seclusion in a cottage, a judicious companion, books of quiet interest, repose in the nearly recumbent position (the head especially being supported), free exposure to the open air, the gentlest exercises, the farm, the fields, the garden—the plants, the corn, the cattle, the poultry (not his own). It becomes an important question also whether the shower-bath, the douche along the spine, &c., &c., may be useful; various sedative or narcotic medicines long given to subdue emotions, as we would give them to subdue pain, in stated forms and doses, regularly and systematically.

The bichloride of mercury, quinine, strychnine, &c., should be put to a cautious trial by competent judges.—*The Institute, Jan.* 4, 1851, *p.* 1.

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## 34.—INFLUENCE OF LARGE DOSES OF QUININE IN NEURALGIA.

By Charles Hogg, Esq.

[Mr. Hogg, speaking highly of this drug, describes it as a sedative to the vascular, but highly excitant to the nervous system. Before commencing its administration, he clears out the alimentary canal by a calomel and colocynth aperient, followed by a saline draught, and in the interval of the cold stage, he advises the following draught to be given every six hours:—Sulphate of quinine, ten grains; dilute sulphuric acid, ten minims; distilled water, one ounce; mix. Mr. Hogg states that he has seldom had occasion to give more then two doses. The following case is given as a sample of its efficiency:]

*Neuralgia.*—My patient is twenty-five years of age, and had been for some time complaining of debility, owing, in my opinion, to her suckling and want of rest. She caught a severe cold about Christmas last, which terminated in a violent attack of toothache, resisting every measure I could think of. A few hours' remission followed the extraction of the dens sapientia and free scarifications of the gums. The pain now assumed a different character, and was marked by a violent, stabbing, plunging pain, beginning at the left angle of the under jaw, running along the ramus, and extending upwards in the course of the facial nerve; at other times the pain would be fixed behind the ear, again in the temple, &c., and increased (and even brought on) by the slightest touch of the skin or current of air. An attack would sometimes come on like an electric shock, preceded occasionally by a peculiar twitching of the muscles of the affected side of the face. The loss of sleep and the violence of the pain had disordered the secretions generally. The digestive functions were restored by a pill, composed of two grains of blue-pill, and five of compound extract of colocynth; and a draught, composed of extract of taraxacum, sulphate of magnesia, and tincture of ginger, continued for a few days. I endeavoured to procure sleep by Dover's powder, acetate of morphia, hyoscyamus, &c., but without success. A slight mitigation of the symptoms were produced by a draught, ordered by my friend Mr. Gay, composed of sulphate of iron, two grains; muriate of morphia, one-sixth of a grain; extract of Canabis Indica, one-twelfth of a grain: it could not be continued, as it seemed to disagree with the child. I had before this prescribed carbonate, sulphate, and citrate of iron, but without avail. I then determined to try the quinine in large doses. She took a draught as follows:—Quinine, ten grains; dilute sulphuric acid, ten minims; distilled water, one ounce. This was followed by distinct remission of the pain, but left a high degree of erethism, a distressing irritability of the acoustic and optic nerve of the affected side, with slight vertigo. Before proceeding further, I obtained the sanction of my friend Dr. Elliotson, who advised the medicine to be continued every sixth hour,—the first dose, ten grains; the next, twelve; and the third, fifteen. After the third dose—that is, the twelve grains, as she had taken two of ten grains—she was completely deaf, particularly on the left side, but had no return of the pain. Generous diet completed the cure. During the last month there has been a slight tendency to a return, which, however, has invariably yielded to two draughts of five grains each. No argument would induce my patient to give up nursing.—*Lancet, November* 23, 1850, *p.* 575.

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## 35.—SEPARATE COURSE OF SENSATION, VOLITION, AND THE INVOLUNTARY POWER, FROM AND TO THE BRAIN, THE OBLONG MEDULLA, AND THE SPINAL CORD.

By Joseph Swan, Esq.

The oblong medulla may be divided into four principal parts. The anterior central part forms the pyramidal bodies; these, with the crura of the brain, give origin to several motive nerves, and may be called the voluntary tract. The posterior surface forms a layer which contains the floor of the fourth ven-

tricle, and forms a bed for the origin of the auditory nerve, and a great portion of the fifth; this may be called the sensitive tract. Between the two preceding tracts there is a large ganglion or case, filled with grey and white matter; and this may be called the involuntary tract. Besides these, there are at the sides the restiform bodies, principally derived from the cerebellum; but it is not intended further to notice them.

The sensitive tract in the oblong medulla is a layer of moderate thickness. It passes upwards as far as the nates, and then obliquely across and underneath these to the inner and posterior margin of the thalamus; it here forms a cord as thick as a swan's quill. It passes outwardly across the thalamus, underneath the optic tract; it sends off a layer of wavy tracts or lines underneath the epithelium of the posterior and descending horns of the lateral ventricle, and is then intermixed with the white matter of the posterior lobe of the brain.

The voluntary tract, after forming layers in the annular tubercle, and combining with the inferior pedicle of the cerebellum, forms the external portion of the crus of the brain, especially that bounded by the involuntary tract and the black matter. The larger part of it passes upwards, communicating freely with the middle and broad portions of the striated body, in its course to the white matter leading to the great commissure and the convolutions of the brain.

The involuntary tract forms in the oblong medulla, between the sensitive and voluntary tracts, a broad thick triangular and somewhat heart-shaped ganglion or case, having partitions filled with gray and white matter; below, it sends processes downwards, to pass at the bottom of the longitudinal fissure between the two anterior quarters of the spinal cord. Opposite the crura of the brain it divides into two portions, each of which is a cylinder, containing pouches filled with gray and white matter. On arriving at the thalimus, each passes outwardly and anteriorly to the sensitive tract; at this part the cylinder forms a distinct ring, from which the involuntary tract is continued across the thalamus, between the sensitive and voluntary tracts; and after communicating with the narrow end of the striated body, becomes combined with the white matter leading to the great commissure and the convolutions of the brain.

In the horse, ox, pig, and sheep, the sensitive tract passes from the posterior surface of the oblong medulla nearly as in man; it forms an expansion underneath the epithelium lining the posterior horn of the lateral ventricle, and the rest is combined with the white matter corresponding with that in the posterior lobe of the brain of man.

The voluntary tract in animals is very similar to the same in man, except that it undergoes a more simple change in the smaller annular tubercle, on becoming combined with the inferior pedicles of the cerebellum.

The involuntary tract in animals is a most curious and interesting structure. It is firmer than any other part of the brain, and, in external appearance, very much resembles a ganglion of the sympathetic nerve. It begins in the thalamus, at the ring by which the soft commissures communicate. It is surrounded by the third ventricle, and its continuation downwards lies beneath the passage from the third to the fourth ventricle. In the fourth ventricle it lies immediately underneath the central part of the sensitive tract. At the ring, it forms a large, round, or oval case of white matter; this is composed in the centre of oblong cells, plainly distinguished by the naked eye in the horse; and into these the gray matter of the soft commissure enters, for connecting their two sides. The ring is very large in the horse; it is connected to the nucleus of the white matter of the brain anteriorly, and with the tænia, and through this with the sensitive tract. From the posterior and outer side of this case white fibres pass off, which go through the narrow end of the striated body to the white matter leading to the convolutions; these fibres correspond with the same termination of the involuntary tract in man. Both sides of the lower end of the case become concentrated in a large ganglion, of the size of half a swan's quill; this is soon joined by a similar ganglion from the opposite case. The ganglion thus formed contracts to the size of a goose's

quill; it then enlarges again in the oblong medulla, and assumes an oblong and pyriform shape, the narrow end being continued into the spinal cord, where it lies in the bottom of the longitudinal fissure formed by the two anterior quarters. The case and ganglions communicate by numerous fibres, especially laterally, with the contiguous parts of the brain, and with the oblong medulla and spinal cord. In the ox the case and ganglia are similar but less. In the sheep they are also similar, but less than in the ox. In the pig the same parts are also similar; the ganglia are not quite so large as in the ox, and are less oval in shape. This large ganglionic mass appears as if it were the source of vital power—for giving energy to all the other parts—for exciting involuntary action constantly in some parts through the fibres it sends through the narrow end of the striated body—and for calling into action all the other parts, when any necessity arises for their assistance.

This brief paper is the result of very numerous dissections, and is an outline of my very constant occupation for many months.—*Med. Gazette, February* 21, 1851, *p* 323.

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## 36.—CASE OF SYPHILITIC DISEASE OF THE DURA MATER AND EXTERNAL PERIOSTITIS.

By Dr. R. B. Todd, F.R.S.

This is a case of peculiar importance and interest. We have first primary and then secondary syphilis; then periostitis, first of external parts, and then affecting the dura mater; and then symptoms of brain disease, both local and distant.

The patient had contracted syphilis fourteen or fifteen years ago, and had a chancre and a bubo. He took a large quantity of mercury without medical advice, and was freely salivated. From many consequent evils attendant upon this disease he seems to have escaped pretty well, and no unfavourable symptom occurred until five years ago, when he applied to one of the metropolitan hospitals for contraction and rigidity of the flexor muscles of his right forearm, and numbness in the same region. The nature of the case was here mistaken, and after leaving this he went from one hospital to another, but got no relief. At length he met with a friend who had suffered in a similar manner, who gave him a prescription, the medicine of which had cured him. He accordingly took it in the prescribed dose and was cured in three weeks. The medicine turned out to be iodide of potassium. Ultimately he sought work in Ireland, and there, about four weeks ago, he had a fit, preceded and accompanied by severe pain in the head. He became alarmed, and returned to London, and was made an in-patient of King's College Hospital, on the 5th of May, 1849, where his complaint was recognised by Mr. Bowman, who prescribed the iodide of potassium.

On his admission he appeared in a very low condition: his face was pallid, and he spoke tremulously: he complained principally of pain in his head, situated in the region of the left parietal bone, and also of great pain and tenderness over the head of the fibula of the left leg. The pain in the parietal region was not increased by pressure, but the region of the head of the fibula was much swollen and extremely tender to the touch. The pain both in the head and the fibula was severe, and became much aggravated at night, so as to deprive him of his rest,—a symptom bearing distinctly on the diagnosis. The situation of the pain in the leg was marked by a swelling of considerable size, which appeared to implicate not only the periosteum, but the ligaments of the joint and the fasciæ. At the situation of the pain in the head, these was nothing to be seen or felt; there was no evidence of inflammation affecting the pericranium; but the pain was very defined both in character and in situation; it was fixed with variable severity in the parietal region, and never left it nor extended beyond it.

In addition to these symptoms, there was a very remarkable state of the *right* forearm—the side, you will observe, opposite to that on which the pain in the head existed. The muscles of the forearm were all in a rigid state, and the fingers forcibly bent into the palm of the hand, the flexor tendons be-

ing rendered quite tense by the firm contraction of the muscles. Moreover there was a good deal of numbness of the forearm, and the rigid state of the muscles both impeded their action and weakened them. There was, in fact, imperfect paralysis both of sensation and motion.

So far, then, we have all the history of the case which can bear upon or be necessary for the diagnosis. I regret that we omitted to make inquiry into one point very interesting in reference to general pathology. He had been married within the last few years; but it was neglected to inquire whether his wife had become pregnant, and whether she had gone her full time, and borne healthy or diseased children. That a man still tainted with syphilis will beget syphilitic children without exciting primary symptoms in the woman, is now well known; and the tendency which women, impregnated by such men, have to miscarriages is also a fact of great interest, especially with reference to the laws of the humoral pathology.

Now the existence of periostitis was quite evident, from the large swelling over the head of the fibula; and the history of the case, the aggravation of the symptoms at night, the influence of iodine, made this part of the diagnosis easy and certain; but what was the connection between the periostitis and the condition of the arm? Was it dependent on some local change affecting the periosteum of the bones of the forearm, and the tendons of the muscles, and perhaps also the nerves, or is it due to some morbid state of a distant part—the brain for instance? I thought for a moment that the contraction and partial paralysis of the forearm might have been dependent on irritation from periostitis affecting the part itself; but very little reflection convinced me that an affection so extensive and of such long duration, was not likely to result from a local cause, nor could I call to mind any case in which such symptoms resulted from a cause of that kind. On looking further into the case I came to the conclusion that the affection of the arm was caused by syphilitic inflammation of the dura mater—the internal periosteum of the cranial bones—in short, an intracranial node—causing pressure on the surface of the cerebral hemisphere, and giving rise to paralysis, with irritation, and consequent muscular rigidity.

This diagnosis was founded on the following points, which our investigation of the case enabled us to make out. First, there was paralysis not only of motion, but also of sensation: this denoted that the paralytic state was due to an affection of the *nerves* rather than of the muscles. Secondly, we could trace no evidence of node, or other periosteal affection of the bones of the forearm; therefore, a local cause was unlikely. Thirdly, the general history of the case distinctly denoted an affection of a syphilitic nature. And lastly, the fixed and constant position of the pain in the head, situated as it was on the side opposite to that on which the paralytic affection existed, indicated mischief in that situation. The occurrence of epileptic fits after the pain in the head and the affection of the arm had existed for sometime, evidently associated that pain with cerebral disturbance.

The train of phenomena in this case was as follows. There was first syphilitic inflammation of the dura mater; this was slow and insidious in its progress, and did not at first cause any great pain; it then produced a certain amount of node: and this, by its pressure upon the surface of the hemisphere, caused irritation and paralysis, accompanied by spasm and rigidity; and, as the pain in the head increased, the paralysis both of sensation and of motion increased. The paralysis, imperfect as it was, and accompanied by rigidity, was just such as would arise from pressure on the *surface* of the brain.

I think, then, there can be no doubt that in this case we had syphilitic inflammation of the dura mater, exactly analogous to that affecting the periosteum of the fibula. Idiopathic inflammation of the dura mater is extremely rare: indeed taking the word *idiopathic* in its strict sense, as implying the absence either of constitutional taint, or the introduction of poison from without, I should say it never occurred. Besides local injuries, scrofula and syphilis are the two common causes of inflammation of the dura mater: of the scrofulous form we sometimes meet with an example in that produced by otitis spreading from the ear to the cranium, the primary disease being almost al-

ways scrofulous in its origin. Indeed the further we advance in our knowledge of pathology the more we must give up ideas of idiopathic inflammations, and the more constantly do we find inflammatory affections to be due to some defect in the excretory functions, or to the introduction of some morbific material.

If anything further could be wanted to establish the correctness of the diagnosis, that is supplied by the perfect success of the treatment which was based upon it. From the history he gives us it appeared that his symptoms on a former occasion yielded to the influence of iodine. On his admission into the hospital he was put upon three grains of iodide of potassium three times a day. The effect was most marvellous: almost as soon as it was given to him the symptoms began rapidly to give way, as the following daily report shows:—On the ninth, three days after admission, the report is that the patient seems decidedly better, has an appetite, pain easier, looks better, sleeps well.

On the 12th.—Better in every way; is able to use his arm; pain in the head gone, in the leg less; swelling diminished.

17th.—Better in every way; pains in the head and leg quite gone; sleeps, eats, and drinks well.

19th.—Quite well in every respect.

Now, if we had failed in our diagnosis, we might have kept this man fo weeks in the hospital, without doing him any good, and perhaps sent him away just as he entered, instead of dismissing him cured of his malady, and in a state fit to resume his ordinary avocations. Nothing can give a clearer idea of the importance of correct diagnosis than the history of a case like this. If the disease had not been arrested, it is probable that more lymph would have been poured out upon the dura mater—the pressure would have been augmented—the fits would have recurred, and the epilepsy, instead of being transitory, would have become confirmed: in fact, it is impossible to say where the effects of the disease would have stopped: whereas, by a careful investigation of the case, a due appreciation of the indications furnished by its history, and the administration of a small quantity of a harmless medicine, the man is restored to perfect health. If any one were inclined to attach but little importance to correct diagnosis, the instance of such a case as this is all that is necessary to prove the danger and absurdity of such views. It shows that the great step towards cure is the right understanding of the nature of the disease with which we have to grapple.

Now, I ask the question—What has been the exact state of the dura mater in this case? I think the best way to answer this is to give you an account of the history and post mortem examination of a case that occurred in my hospital-practice some years ago. These cases are generally capable of cure, if detected early; but if allowed to go on too long, new products are formed which permanently damage the brain, and are not susceptible of cure. The case to which I allude is as follows:—

A woman, aged thirty-one, was admitted into the hospital some years ago, suffering from the following symptoms:—great loss of memory, fits, imperfect palsy of the left side, and pain in the right parietal region. She was a married woman, and had lost her husband, and she attributes her illness to grief from this cause. About this time, which was between five and six years before her admission, the pain in her head began. She led an irregular life, was intemperate, and of easy virtue, and contracted syphilis, and had chancre, sore throat, papular eruption, and nodes on the tibiæ. Two months before her admission, she had her first fit: it came on shortly after she had eaten a hearty supper. She became insensible, was much convulsed, especially on the left side, bit her tongue, and after the convulsions had ceased she remained in a drowsy state for twelve hours. After this, the pain in her head increased considerably, and was more fixed and defined: it was referred to the right parietal region. The fits likewise recurred frequently; they were always preceded by a sense of painful numbness in the left hand and foot. The *right* pupil was occasionally more dilated than the left, and the right upper eyelid hung lower than the left, as if the third pair of nerves on the right side were slightly affected.

This woman became more and more comatose, and had a severe fit in the hospital, from which she never rallied. On a post mortem examination, we found the dura mater firmly adherent to the cranium, and also to the visceral layer of the arachnoid, for an oval space two inches in its long, and an inch and a half in its short diameter. At this part the dura mater was three or four times its natural thickness. Between the layers of the arachnoid there were two large masses of a yellow colour, like concrete pus, opposite to which were corresponding depressions or concavities on the surface of the cerebral hemispheres. At these points the cerebral substance was slightly softened, and redder than is natural. At the corresponding point on the opposite side of the skull a similar morbid alteration in the dura mater and the arachnoid was commencing. There was no disease in any other part of the brain.

Now, this is a good typical case, illustrative of the way in which syphilis may affect the parts within the cranium, and the extent, when not early arrested, to which it may proceed. The dura mater, like any external periosteum, becomes affected by the syphilitic poison; then follows arachnitis; and lastly, cerebral compression, and perhaps red softening. No doubt changes of this kind would have taken place in our patient (Baglin) if the progress of his disease had not been arrested. If the woman, whose case I have just related, had come into the hospital three or four months before the time she did, and had been put under a course of iodide of potassium, we cannot doubt that she would have completely recovered.

Let me give you another example of such a case, in which the disease had not gone so far as to be beyond the power of remedies. The patient in this case was a young man, who followed the business of a chemist and druggist. There was a distinct history of syphilis. He had experienced a good deal of pain in the right parietal region, which was treated as neuralgia. From this treatment no benefit resulted, and shortly afterwards he began to suffer from imperfect paralysis of the left arm and leg; and I noticed decided thickness of speech, his manner became dull, and his spirits much depressed. The paralysis then became general on the left side, affecting his face, and his scalp became tender over the painful region. I determined to put him under treatment calculated to relieve inflammation of the meninges, and accordingly gave him calomel and opium, and applied tartar emetic ointment to his head. In ten days his paralysis had vanished, and all his other symptoms had left him.

There is another case which you have frequent opportunities of witnessing, as he is a frequent inmate of the hospital: his name is Coulson, and he affords a good example of very complete paralysis of the fifth nerve of the left side. I have no doubt that syphilis is at the root of the disease in this instance too. The man is subject to epileptic fits, the immediate exciting cause of which is intemperance. I think the exact diseased condition in this case is syphilitic inflammation of the dura mater in the vicinity of the fifth nerve and the Casserian ganglion; that lymph has been poured out which presses upon the ganglion, and, including both the sensitive and motor portions of the nerve, suspends alike their respective functions.

There are one or two more points touching cases of this class, with which I will conclude what I have to say to you to-day.

And, first, as to the causation of the epileptic fits which occurred in three out of four of the cases I have related, and which I can scarcely doubt must have occurred in the fourth case had it been suffered to proceed much further. The occurrence of epileptic fits in such cases as these appears to me to denote that the brain itself is involved in the morbid action, either by extension of irritation from the diseased parts, or by the direct influence of the syphilitic poison; but in all the cases the simple existence of the diseased state of the dura mater did not seem sufficient to cause the fits. The morbid process had been of long continuance in the dura mater before the fits began. They seem to have been brought about by causes operating on the whole system—upon the blood—upon general nutrition—and upon that of the brain in particular which must have already suffered a good deal by the neighbouring disease of the dura mater.

In some cases of meningeal disease, especially, I think, when the pia mater

is previously affected, we meet with fits of a very remarkable character: I have called them *epileptiform*. One arm, or both arm and leg on one side, become seized with convulsive movements, quite of the clonic or epileptic kind. These come in paroxysms; the paroxysm lasts a variable time, and then subsides, leaving more or less general exhaustion and disposition to sleep; but consciousness is not impaired. Yet there can be no doubt that such fits may pass into the true epileptic fit; for it is not rare to see a very complete epileptic fit commence with some local derangement of sensation or motion, or both.

Secondly, the extraordinary influence of iodide of potassium in controlling syphilitic periostitis is highly deserving of your attention. We hear a great deal about specifics, and many medicines have the name with very slender claims to it; but if there is anything in addition to quinine which deserves the name of a specific, it is the iodide of potassium, for syphilitic periostitis. If you have a *pure* case it acts like a charm, so that the treatment materially aids the diagnosis; for we may fairly set it down as a fact, that if the symptoms yield completely and at once to the influence of iodide of potassium, the disease is essentially syphilitic.

But, although iodide of potassium unquestionably exerts a wonderful influence over these syphilitic periosteal affections, nothing is more certain than that its effect is far from being permanent. It is very common to meet with cases of periostitis which at first yield readily to the influence of iodide of potassium, and the patient continues well for a time, when all the old symptoms return. It was thus in Baglin's case: some time before his admission into the hospital he took iodide of potassium, and the symptoms yielded, but they afterwards returned, and were again removed under the influence of the same remedy. I think it not at all improbable that he may again have a return of the symptoms, and may once more come into our hands.

The knowledge of these clinical facts teaches us that we must not speedily abandon the use of the iodide or of iodine in some other form in cases of this description. In the present state of our knowledge we can scarcely determine whether the iodine acts by eliminating the syphilitic poison, or as an antidote. Possibly it may act in both ways; it may at once promote the action of emunctories, and so increase the amount of matters excreted from the blood; and it may unite with the syphilitic poison and form an innocuous compound, of which, however, the iodine element disappears more quickly than the syphilitic, leaving, after a time, the syphilitic in undisputed sway in the system.

In such cases we must trust to the repeated use of iodine as one element of cure, care being taken to watch the constitution of the patient during its administration. And we may aid the influence of the iodine by the occasional use of mercury, either at the same time with the mercury, or, as I prefer it, alternately,—that is, giving first a short course of mercury, then of iodine, then of mercury, and then omitting both, and using only tonic means, both medicinal and hygienic, resuming, if occasion should demand, the mercurial and iodine treatment.

But you must always bear in mind that *time* is an important element of cure in these cases; and, therefore, we must be careful to uphold the powers of our patient, not to weaken them by our treatment; for, by so doing, we should not only retard his favourable progress, but by weakening the vital powers of the patient, give a stronger hold to the poison. We have seen, in the history of Baglin's case, how a state of enfeebled nutrition from bad living clearly favoured the development of the serious symptoms: hence we must encourage our patients to expect a favourable issue; impress upon them the necessity of a steady perseverance in a general plan of treatment, and point out the dangers of swerving from the hygienic or dietetic rules laid down for them.—*Med. Gazette, January* 3, 1851, *p.* 1.

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## 37.—CASE EXHIBITING CEREBRAL SYMPTOMS WITHOUT CEREBRAL LESION.

By Dr. R. B. Todd, F. R. S.

[This case is highly illustrative of important points in pathology, and will well repay a careful attention to its interesting details. It occurred in a

heavy lethargic patient, addicted to intemperate habits formerly, who for the last eight years had been a teetotaller. The consequence of his former habits, however, were beginning to manifest themselves even after this long period.]

Five years before his admission he began to have œdematous swelling of his legs, but this did not last long: it was probably owing to some temporary want of action of his skin. His next symptom, which commenced six or eight months before he was admitted, was frequent micturition at night: he was compelled to get out of bed six or seven times of a night. This was probably due partly to an irritable bladder, and partly to the quantity of urine secreted. He next became affected with head symptoms: he suffered from violent pain in the vertex, which continued ever after unabated. Soon after this his sight began to get dim, the little and ring fingers of his left hand became benumbed, and he felt very drowsy and unable to work,

The report goes on to describe him as "a heavy-looking man, thin and pallid; the complexion peculiarly sallow, as if the red particles of the blood were not only deficient, but as if the hæmatine were altered; frequently staring with a vacant gaze, answering questions very slowly, and appearing as if he felt it irksome to be made to reply otherwise than in monosyllables: moving his limbs about very slowly, and apparently with effort; pupils equal, contracting sluggishly."

Now, a patient coming to you with such a catalogue of symptoms as this, you would be tempted to set the case down as one of disease of the brain, in which the primary mischief is seated in that organ; and, if you made no further inquiry, you would immediately direct the whole force of your treatment to the head. Indeed, some years ago, this is what all practitioners would have done; for, in the state of knowledge then, they could not have known what else to do; but we now know that such symptoms as I have already detailed to you, referable as they certainly are to the organs within the head, ought, nevertheless, to direct our attention to other organs likewise—namely, to the kidneys, and more especially if, in addition, the patient has a pale sallow complexion, such as was very well marked in Jeffreys. Then, turning our attention in this direction, what information did we get in the present case? Why, we found that the quantity of urine was considerable, and that its specific gravity was very low; that it was acid, contained albumen, and that, on being allowed to stand, it threw down a scanty precipitate, which was found to consist of epithelium, of transparent casts of uriniferous tubes, and of one or two cells containing a considerable quantity of fat.

Here, then, we get a satisfactory explanation of the head symptoms—a true and sufficient cause for them; we find them to be *secondary*, resulting from previously existing and primary disease of the kidney. It was evident that the general nutrition of our patient was considerably impaired; and, as the result of this impairment of nutrition in general, there was of course an impairment of the nutrition of the brain in particular: and, moreover, although there was a considerable quantity of urine passed—for some days, indeed, the quantity of urine was so large, as much as nine pints, or even ten pints, as to have led us to test for the presence of sugar—still it is probable, from its low specific gravity, that the due quantity of urea, and other solids of the urine, was not eliminated; and thus the blood, and the various organs, were poisoned at the same time that they were imperfectly nourished. And this twofold aberration from the healthy standard—this actual poisoning, as well as imperfect nutrition of organs—this nourishment by not only a poor but a poisoned blood, which inevitably results from chronic renal disease—explains how a category of symptoms similar to those above detailed may arise from a particular state of the kidneys. I do not say that these symptoms may not occur in cases where there is no kidney disease, but I do say that, in a considerable number of cases in which they are present, kidney disease will also be found.

The circulation was feeble, the pulse small and weak; but the heart's impulse was strong, and was felt over a greater surface than was natural. There was, however, no correspondence between the heart's force and that of the pulse, nor was there evidence of any valvular disease. At no time was there much dropsy. It never exceeded a moderate anasarca of the legs and a slight puffiness in the face.

This man continued in the hospital for four months with scarcely any variation in his symptoms. He complained constantly of more or less headache, referred for the most part to the vertex, was always more or less lethargic, slept a great deal during the day, and always heavily at night, but was frequently woke up by frightful dreams. He was often sick and vomited his meals. He had no paralytic symptom, except a numbness of the left side of his face, and a similar numbness of the little and ring fingers of the left hand. Up to the day of his death continued to pass pale urine in considerable quantity and never exceeding 1012 in specific gravity, and always containing a very notable, although not very large, quantity of albumen.

For some days we compared the quantity of urine which he passed with the quantity of his drink, and found that they maintained a pretty close relation, —sometimes the latter exceeding the former; at other times the reverse; but in either case the difference was never more than from half a pint to a pint.

You will remember—those of you, at least, who are accustomed to accompany me through the wards of the hospital—that I had no difficulty in saying the disease was renal, and in indicating of what sort it was. I told you that the kidney was contracted, shrivelled up, from the atrophy and obliteration of numbers of the uriniferous tubes, altering the relations of the tubular and intertubular structures, creating congestion in patches and obliteration of some vessels, and interfering with the healthy formation of epithelium. This diagnosis rested upon the absence of more decided symptoms of brain disease than the pain, the lethargy, and the numbness of one or two parts, and upon the known sufficiency of renal disease to disturb the nervous system in the manner and to the extent to which that disturbance existed in our patient. It was likewise indicated by the peculiar complexion of the patient (no hæmorrhage having taken place from any other organ than, perhaps, the kidney), by the presence of albumen in the urine, by the dropsy, and by the large quantity of urine passed.

This last symptom, with the pretty uniform specific gravity of the urine, the small amount of albumen, and the moderate extent of the dropsy, led me to infer that the disease was *contraction* of the kidney, due to a chronic degeneration of that organ. In the large kidney, which owes its enlarged condition to the deposition of fat in the epithelium cells, and in that which is enlarged by the undue formation of epithelium to the distention of it within the tubes, the urine is deficient in quantity; it has a decidedly smoky hue, generally contains blood, and always albumen in large quantity, often as much as in the serum of the blood.

The diuresis which is often present in these cases, and which was so marked a feature of that which we are now considering, is explained by the condition to which the renal structures are reduced as the result of chronic disease. The tubes being stripped of epithelium and consisting solely of basement membrane, admit an abundant percolation of the watery part of the secretion throughout their whole length, which, if they possessed the healthy amount of their epithelial lining, would occur only at the Malpighian bodies. This great discharge of water was, however, a most fortunate thing for our patient, for it enabled him to get rid of a much larger amount of solid matter than he would otherwise have been able to do. Had this free excretion of water been checked at any time, serious symptoms would no doubt have instantly shown themselves in epilepsy or coma. By Mr. Beale's analysis it appeared that shortly after his admission the urine contained twenty-one parts of solid matters in a thousand, and these solid matters themselves consisted chiefly of *albumen* and *extractive matters*, whereas half that quantity at least ought to be urea. Nor would the increased flow of such urine as he was passing carry off a sufficient quantity of the organic and saline constituents to purify the blood. On the contrary, the large amount of solid matters excreted, about 1800 grains per diem, instead of about 1100, injured the blood as the nutrient fluid of the system, by depriving it of so much albumen. Still you can readily understand how even a slight check to the renal secretion would prove mischievous by diminishing still further the small amount of excretion of the proper organic matters of the urine.

The prognosis of a case like this is always unfavourable. If the secretion is copious the patient may linger on for some time, as happened in the present instance; but if the secretion is interfered with, the patient will presently die. And although in our patient the flow experienced no diminution, he died suddenly, although I cannot say unexpectedly, the manner in which he died differing somewhat from that of many other cases of the same disease. For some time previous his symptoms had been getting more aggravated; he had become more drowsy and lethargic, more doughy-looking and blanched, and the dropsy had gained on him, although not to any great extent. One night, without, however, having had any premonitory symptoms, he suddenly became comatose, breathed with stertor and puffing, his pulse became slow and languid, his respiration interrupted with increasing intervals, till it gradually and finally ceased. There were no convulsions. The time from the first access of the coma to his death was not more than a quarter of an hour.

The manner of death showed that it was owing to some change in the brain; and the short duration of the coma, and the speedy supervention of death, would go far to localize the lesion. Of this supposition the post-mortem examination was quite confirmatory: the following were the conditions that it revealed:—On opening the cranium the membranes were found quite healthy, on removing the brain a clot was found in the fourth ventricle, which proceeded from the left lobe of the cerebellum; having broken down the substance of that centre to enter the ventricle. The blood had passed through the iter into the third ventricle; having filled which it passed on either side, through the foramen of Monro, into the lateral ventricles, which it traversed, following the course of the choroid plexuses, and finally descending into the inferior cornua. The blood had coagulated into a firm, coherent clot, so that the whole could be taken out as a mould of the cavities and connecting passages. The choroid plexuses were lying on the inside of the clot apparently healthy. The anterior cornua were filled with serum. The hemispheres of the brain were healthy.

Now I think, in all cases where death supervenes very speedily on apoplexy, the clot will be found in a similar situation to this, involving, if not confined to, the mesocephale. Death is the more speedy the nearer it is to that important and central portion—that nucleus of the brain. Upon this subject I have so often had occasion to descant, that I need not dwell upon it now. I shall content myself with having drawn your attention to this point as a result always to be expected in apoplectic effusions.

I may also refer you to a symptom which occurred in this case, and which is, I think, a very fatal symptom.—namely, flapping of the cheeks in respiration. It is due to paralysis of both the buccinator muscles, and is the result of great compression of the brain, or of it near the centre of respiration, which is also the seat of implantation of the facial and fifth nerves upon which the action of these muscles depends.

The kidney which I show you here were found in exactly the state which I described to you. Observe the surface, how shrunk, granulated, and fissured it is, and, on cutting it, how the organ is wasted, at the expense chiefly of the cortical substance. On a microscopical examination it was found that the tubes were stripped of their epithelium; in some parts the cells were filled with fat, but the great character of the epithelium was its scantiness and its imperfect organization. The thinness of the walls of the uriniferous tubes, as I have already explained, was favourable to the secretion of water, but not of organic matter, which is separated solely by the agency of the secreting epithelium; the former, holding albumen in solution, was therefore carried on with an energy proportional to its abundance, but the organic constituents of the urine would be secreted only in proportion to the quantity of epithelium existing in the kidney.

Coupling together the clinical history and the morbid anatomy of the case, there can be no doubt that the state of brain was dependent on the state of the kidney; and, had it not been for what we may call the *accident* of the apoplexy, the patient might have lived on for some time longer, might have had several

epileptic fits, and have probably died in one of these, or from the exhaustion which follows such attacks.

Taking together the state of the kidney and the state of the cerebral function, nothing can be clearer than this class of cases, but, putting the state of the kidney out of question, nothing can be more obscure. There is no doubt that the kidney is the *primum movens:* the blood becomes poisoned; this poison interferes with perfect sanguification, a poor nutrient fluid is carried to the brain, which becomes as a consequence, ill nourished; add to this the actual presence of urea, and other solids of the urine, in the brain, and we have quite sufficient to account for all we see.

In the treatment of this case there was really little to be done. It is not improbable that, by the frequent blistering of the neck and scalp, and other means of counter-irritation employed, such as the long issue in the scalp, we may have retarded the mischief within the cranium and prolonged life somewhat; but otherwise I do not see that we have any right to take much credit to ourselves for any benefit the patient may have derived.

This is one of those maladies which, the more we know as to its intrinsic nature, the more we feel the impotence of our art to effect a cure. And so far, indeed, ignorance would have been bliss; in a certain sense, if it be not folly to be wise, our increased wisdom is attended, at least, with results less flattering and agreeable to our vanity. Still the knowledge of the disease —a correct diagnosis—no doubt saved the patient from many blind and haphazard trials of remedies, which might have diminished his strength without any promise of good.—*Med. Gazette, January* 17, 1851, *p.* 89.

## 38.—THE DANGER OF INCAUTIOUSLY MOVING PATIENTS IN DELIRIUM.

By Dr. R. B. Todd, F.R.S.

[In a clinical lecture alluding to this subject, Dr. Todd remarks:]

I have met with more than one instance of bad consequences following upon moving a patient in delirium, or just recovered from it, prematurely. About two years ago a man was admitted here for epileptic delirium. Finding that his delirium was very noisy, and disturbed the other patients, I had him moved into a separate ward, when he recovered from his delirium. He was moved up stairs, and shortly afterwards he became delirious again, and died comotose.

I am satisfied, from this and other cases, that there is nothing respecting which we need to be more cautious than as to removing patients either in or just recovered from delirium; even to move them from one room to another on the same floor is dangerous, still more moving to any distance, or to another floor.—*Med. Gazette, Jan.* 17, 1851, *p.* 93.

## 39.—ON THE PHYSIOLOGICAL PROPERTIES OF PICROTOXIN.

By Dr. R. M. Glover, F.R.S.E., Lecturer on Materia Medica in the Newcastle-on-Tyne School of Medicine, &c.

Dr. Glover states that some years ago he was induced to make some experiments upon the active principles of many drugs, chiefly to ascertain how far the statements of other investigators agreed with his own conclusions from them. He states that many of these differed materially from some arrived at by others. On his examining picrotoxin, the active principle of the cocculus indicus, he found that it induced remarkable and peculiar backward movements shewn in a slight degree by convulsive twitches of the head, neck, and shoulders backward, and in an extreme degree by a regular forced retrogression. Premising a brief notice of the nature and chemical properties of the drug, he proceeds to relate his experiments.

Picrotoxin is obtained by boiling the berries of *cocculus indicus* in a sufficient quantity of water. The decoction is then filtered, and acetate of lead added as long as precipitate falls. The liquid is filtered and cautiously evaporated to the consistence of an extract. This is to be dissolved in alcohol; and the solution evaporated to dryness. The solutions in alcohol and water must be

alternately repeated, until the dry residue is completely soluble both in alcohol and water. This is picrotoxin, with a little colouring matter. By agitation with a little water, the colouring matter, which is very soluble, is removed, and a number of crystals are separated, which are picrotoxin, nearly pure.

This substance crystallises in needles or silky filaments, in transparent plates, in radiating and mammiform masses, or in hard granular crystals. It is soluble in twenty-five times its weight in boiling water, and about 150 times its weight of water of the temperature of 57°. Alcohol, sp. grav. 0·810, dissolves one-third of its weight of it. Sulphuric ether, sp. grav. 0·7, dissolves two-fifths of its weight of it. Its alkaline nature is doubtful. It is very bitter. The formula is, $C_{12}$ $A_7$ $O_5$.

The picrotoxin with which I experimented was in beautiful white needles; and I could have no doubt of its purity, both from the sources from which it was obtained, and its possession of the chemical properties ascribed to the substance, and also from the physiological properties observed in its action on animals corresponding to those ascribed to the *cocculus indicus* and to picrotoxin.

The most full, and apparently exact, description which I can find of the toxicological action of the crude drug is contained in Orfila's 'Toxicologie Générale.'

Orfila says:—"In comparing the effects of picrotoxin with those of *cocculus indicus*, I have tried to determine the action of these substances."

"*Experiment* 1.—When robust dogs are made to swallow twelve or sixteen grammes of *cocculus indicus*, pulverised as much as possible, and the gullet is tied after the injection of the poisonous substance, we remark that these animals are not long in making efforts to vomit. At the end of twenty, twenty-five, or thirty minutes, their walk and attitude are tottering, their eyes prominent and haggard, their muscles are agitated with a trembling, which is at first slight, but is augmented by degrees; soon afterwards their features are affected by convulsive movements of various muscular parts of the face; contortions and horrible grimaces announce a general nervous attack; all at once they make some steps backwards, the fore-legs stiffen, they stop, and with difficulty avoid falling by reposing on the posterior limbs; the head ere long experiences a violent shock, like that caused in frogs by a strong electric discharge; sometimes these motions are sufficiently strong to cause this part to be reversed on the trunk, and to produce a somerset backwards, in which the head strikes the ground with violence, and the body rolls in all directions." He then describes the "temporary recovery of the animals, and their death under repeated attacks of the most terrible convulsions."

In the experiments with picrotoxin itself which he relates, the peculiar movements which I am about to describe do not seem to have been so distinct as in my experiments; and the idea does not appear to have occurred to him that the movements produced are exceedingly similar to those which occurred in the experiments of M. Flourens, where sections were made of various parts of the encephalon.

I shall now proceed to relate my experiments, premising that I do not describe every symptom observed, since such a description would swell this paper to an inconvenient bulk.

*Experiment* 1.—A mongrel dog was forced to swallow twenty grains of the poison. In a few minutes he seemed uneasy. In twenty minutes he vomited freely; salivation followed, and general tremors. In half an hour from the beginning the salivation was profuse. In about three quarters of an hour there were severe convulsions—opisthotonos. He then attempted to move backwards, but fell down with his fore-legs extended. In an hour the breathing became laborious; again another spasm of opisthotonos. The spasms diminished gradually in severity; but the saliva continued to flow. In an hour and twenty minutes he again vomited. In two hours he had partially recovered, and was able to go about, but was still salivated. During the night he made his escape.

*Experiment* 2.—A bull-dog had thirty grains of the poison inserted under the skin of the *axilla*. In ten minutes tremors came on. In a quarter of an hour

he had a stool, and began to run backwards. He then stopped, and commenced to make peculiar movements with his fore-paws as if swimming, and to scratch the ground with his fore-feet. At the twentieth minute he vomited, and seemed to have little power over his limbs; in two minutes more he passed urine and fæces, and again began to scratch the ground. Frequent vomiting and salivation ensued, and he had bloody stools. At about the twenty-seventh minute there were tremors of the whole body, and backward movements of the head. He continued thus, frequently passing urine and bloody stools, and occasionally moaning. In an hour and twenty minutes he had a violent spasm of opisthotonos. He had also several of the backward movements. A bloody discharge was constantly flowing from the rectum, and saliva from the mouth. The breathing laborious, and heart's action frequent. The spasms of opisthotonos became absolutely dreadful. In their interval the animal staggered, and occasionally fell down, with dilated pupils and bloodshot eyes. He would sometimes batter the ground with his head, and grind and gnash his teeth, so that the sound could be heard for some distance. The mouth was filled with dust, and bloody. At about the second hour, the symptoms began to abate somewhat, and in the course of the day he got gradually better.

In three days he got comparatively well, but still had constant tremors, was stupid, and had little appetite. I now inserted two scruples under the skin of the groin. The symptoms were very similar to those which occurred in the first experiment. The retrograde movements were occasionally very distinct, and the animal, while lying on the ground, would sometimes work himself round in a circle. At the forty-fifth minute, he got up and rushed forward, a terrific object, the saliva and bloody foam flying in *sheets* from his mouth, and his eyes glaring. He suddenly stopped, ran right backwards, and was seized with a violent fit of tetanus, at the end of which he was dead.

On opening the body, the facts and appearances observed were as follows:—Almost total extinction of the muscular contractility; the heart was irritable—the auricles much more so than the ventricles. Both cavities of the heart were distended with black fluid blood; the lungs, although somewhat darker than natural, were crepitant and collapsed. The stomach and intestines showed considerable marks of irritation. The peristaltic movement went on. The brain and its membranes were greatly congested, especially the lower portion, the *cerebellum*, *corpora quadrigemina*, and upper portion of the spinal cord. There was much bloody serum in the ventricles of the brain.

*Experiment* 3.—I was desirous of testing the action of the poison on an animal peculiarly likely, I thought, to show the effects on locomotion. I selected a female ass. Sixty grains were put under the skin, but nothing was observed except tremors, some striking out of the limbs, and exhibition of general uneasiness. On this after an interval of time, during which the animal had quite recovered—in fact, a delay of weeks occurred—120 grains were put into the mouth, and she was forced to swallow. An hour elapsed, and hardly anything was observed, except some slight tremors. From the little effect of the sixty grains before administered, I was afraid that the quantity was insufficient to affect materially so large an animal, and 100 grains were again introduced into the stomach. The dose had hardly been administered for a few minutes when the animal became salivated; she then began to strike the ground with her fore-feet. The breathing became laborious,—she suddenly ran backwards for at least twenty paces, fell on her side, and expired after a terrible fit of tetanus, which lasted about five minutes.

The *post-mortem* appearances were similar to those of the dog. The stomach was not examined. There was the same want of irritability of the voluntary muscles, but the heart contracted on being irritated. The congestion of the base of the brain could not be mistaken; and that of the vermiform process of the *cerebellum* was very remarkable.

[Ten grains of the poison were introduced in the same manner under the skin of a rabbit, and the same results were obtained, the backward movement being distinctly exhibited. The same quantity put under the axilla in a pigeon induced similar movements, with peculiar strange motions of the feathers which seemed agitated in all directions. The animal gradually fell on its side, and

by movements of one wing contrived to turn itself round in a circle, as if rotating on a pivot, and this lasted for some minutes. The experiment repeated on a frog, shewed a similar circular movement as in the last experiment, followed by the retrogressive actions. These experiments are related to shew the striking resemblance between the peculiar results obtained by M. Flourens on the section of some of the nervous centres, especially of the corpora quadrigemina and cerebellum.]

I quote the following from the report of Cuvier on the experiments of M. Flourens:—"After the effects of the removal of the brain, properly so-called, M. Flourens examines those of the extirpation of the *corpora quadrigemina*. The removal of one of the pair (bigeminal), after a convulsive movement, which soon ceases, produces, as a lasting result, blindness of the opposite eye, and an involuntary turning; that of the pair renders the blindness complete, and the turning more violent and more prolonged. Nevertheless, the animal preserves all its faculties, and the iris continues contractile. The complete extirpation of the tubercles (*corpora quadrigemina*) alone paralyses the iris. . . . . What then is most curious in the experiments of M. Flourens, is that part which relates to the functions of the *cerebellum*. During the removal of the first layers, there was only a little weakness and want of harmony in the motions. When it came to the middle layers, there was almost general agitation—the animal, still continuing to see and to hear, only executed quick and irregular motions. Its faculty of flying, walking, and keeping itself erect was lost by degrees. When the whole *cerebellum* was removed, this faculty of executing regular movements had entirely disappeared."

I have not space, nor is it necessary, to extract many of the experiments of M. Flourens; but the following bear so directly upon the subject, that I think it necessary to quote them:—"I gradually removed the *cerebellum* of a swallow: this bird was soon reduced to such a state, that it could only fly in the most singular and extraordinary manner; it went back instead of advancing; it rolled on flying; its flight had all the appearance of the most complete drunkenness. With this exception, this animal, like the others, preserved all its perceptive and intellectual faculties." He goes on: "I removed the *cerebellum* of a young and vigorous dog by successive slices. The animal lost more and more the faculty of moving with order and regularity; soon he only walked tottering and by zigzag; he went back when he wanted to advance; when he wanted to turn to the right he turned to the left. As he made great efforts to move, and was no longer able to moderate these efforts, he rushed forwards with impetuosity, and finished by falling or rolling on himself. If he found an object on his road, he could not, whatever design he might have, avoid it. He hit himself right and left. Nevertheless, he heard and saw very well: when irritated he sought to bite, and bit an object when he could meet it; but he could not dispose of his motions with such precision as to meet it often."

Those who witnessed my experiments will agree that this was almost exactly the character of the phenomena which picrotoxin produced.

The congestion at the base of the brain in the animals poisoned in my experiments was ascertained both by the eye and by examining the cerebral matter with the microscope.

I am aware that congestion is often vaguely described, and too much attributed to it; but I could hardly be mistaken in the appearances presented, as I have examined the brains of hundreds of animals after death from poisons. I do not, however, mean to infer that this excessive vascularity of the cerebellum was the *sole cause* of the phenomena.

I drew the following inferences from these experiments:—

1. Picrotoxin has the power of determining peculiar movements and effects, very similar to those described by M. Flourens as resulting from section of the *corpora quadrigemina* and *cerebellum*. I do not think, however, that the animals in my experiments were blind until just before death (if then), as in the cases where Flourens removed the *corpora quadrigemina*. The iris was certainly in some cases contractile until the symptoms became very severe.

2. Picrotoxin also acts powerfully on the spinal cord, and generally is a narcotico-acrid poison.

3. Although a most terrible poison, it is not so formidable in small quantities as conia, aconitina, and others of these active principles.

4. The animal temperature was much increased in some of those experiments, forming in this respect a great contrast with some facts I observed several years ago, showing the great diminution of temperature undergone by animals slowly poisoned by the chloride and bromide of olefiant gas, chloroform, bromoform, &c. How far the increase of temperature was owing to excitement of the nervous system I shall not pretend to decide.

It appears to me that these peculiar movements, which are certainly not voluntary, should also be distinguished from reflex movements. It is not easy to see how they tend to the conservation of the individual. As voluntary movements originate from the brain, and reflex motions from the spinal cord, these other movements appear to be connected principally with the cerebellum. My results strengthen so far those of Flourens, which latter can no longer now be ascribed to the mere mutilation of the animal.

Similar movements have been occasionally observed in disease, in animals wounded by shot, and in drunk people.—*Monthly Journal of Med. Science, April*, 1851, *p.* 305.

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## 40.—TARTARIZED ANTIMONY IN INSANITY.

In the 'Annales Médico-Psychologiques' (July, 1850), the following abstract is given of Dr. Flemming's views, as contained in the 'Allgemeine Zeitschrift für Psychiatrie.' The author examines in this article the action of tartarized antimony in the treatment of mental diseases. This action varies as the medicine is administered in large or in fractional doses. In a large dose, it has been seen to cut short instantaneously a fit of insanity; and the patient, after a certain period of torpor, has almost lost the recollection of his excitement. But, to produce this effect, the medicine ought not to produce vomiting. When the emetic is given in fractional doses, it produces nausea, and exercises a kind of indirect sedative effect, in consequence of the modifications which result from it in the functional condition of the digestive organs. The editors of the 'Annales Médico-Psychologiques' add to the observations of Dr. Flemming, that the administration of the drug requires certain precautions, which cannot be neglected without producing the most serious results. There are, say they, patients who appear to bear the tartarized antimony perfectly well, and there are some on whom the medicine appears to have no effect; the excitement continues, and there are neither stools nor vomiting; all of a sudden, the excitement is calmed, a colliquative diarrhœa is established, and there is exhibited as severe a degree of poisoning as if there had been given at once the whole of the successive doses administered on several days. This fact ought to attract the attention of practitioners, because the same is the case with other medicines. This may be explained in two modes; either the medicine is accumulated in some degree in the stomach, where it does not act till it reaches a certain dose, or its action is latent, and the last dose is no longer tolerated like the preceding ones, by reason of the modifications which have supervened in the sensibility of the internal organs.—*Journal of Medicine, December*, 1850, *p.* 1181.

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## 41.—BRUCINE IN LEAD-PALSY.

As an internal remedy in lead-palsy, brucine possesses advantages over strychnine, as it is capable of being safely administered in larger doses. M. Bricheteau gives it at first in doses of two or three centigrammes (about one-third to half a grain) daily, and sometimes raises the quantity to eighty centigrammes, but this is rarely necessary. At the dose of from ten to fifteen centigrammes, it produces slight twitchings, with a creeping sensation in the limbs. When the dose is raised to twenty or twenty-five centigrammes, the twitchings become more powerful and begin to be accompanied by stiffness of the limbs, which are put in a state of forced extension. When the patients are still the convulsive movements are slight: but if they move in bed, the twitchings and tetanic symptoms appear. When they walk, their limbs become stiff, and they fall

forward if not supported. These symptoms are not accompanied by disturbance of the intellect, nor by headache.

In a case lately under the care of M. Bricheteau, of paralysis of the extensors of the thumbs and fingers, the good effects of this treatment were complete The paralysis was complete; but, in a month, the patient was able to raise the thumbs, and ultimately made a perfect recovery.—*Bulletin de Therap.*—*London Journal of Medicine, January*, 1851, *p.* 66.

## DISEASES OF THE ORGANS OF CIRCULATION.

### 42.—THE PULSE.

By Dr. R. B. Todd, F.R.S.

[In a clinical lecture on this subject, Dr. Todd says:]

The frequency of the pulse is affected by various morbid influences, of which the following are the most potent:—

1. *The condition of the blood.*—A poor blood is almost always associated with a rapid pulse; in animals bled to death the pulse attains an increasing frequency as the blood flows; this occurs in men who have been very largely bled, and in cases of excessive hemorrhage, whether hæmoptysis, epistaxis, or hæmatemesis, or after surgical operations, the pulse attains great rapidity.

2. *The existence of a poison in the blood.*—This tends generally to increase the frequency of the pulse, and so you find the pulse quick in the early periods of the exanthemata of typhus. The administration of alcohol to a healthy man affords a good illustration of this; as soon as he has taken a certain quantity of it, acceleration of the pulse takes place. But some poisons will produce a contrary effect, by depressing and weakening the heart's action, as you well know in the administration of digitalis, or of hydrocyanic acid. So also, some of the animal poisons, if taken in large doses, will cause depression of the heart's action and a slow pulse. We have now a case of scarlet fever, in a man named Boon, in Rose Ward, with whom the pulse was as low as 60 before the eruption had come out fully; a state which seemed to me to indicate the use of stimulants, and under their administration the heart's action increased in force and frequency, and the patient did well.

3. *The state of the nervous system exercises a very remarkable influence upon the rate of frequency of the pulse.*—It is one of the features of the hysterical diathesis, that the pulse, always quick, becomes accelerated under the slightest disturbance, physical or mental. Cerebral lesion sometimes causes a very depressed state of pulse; as, for example, inflammation of the brain, vomiting, pain in the head, and sluggishness of pulse, are symptoms which should always awaken the anxiety of the practitioner, as regards the state of the brain. In many instances of injury to the head, concussion, fracture with depression. the pulse becomes notably retarded until the compression of the brain has been removed. So also in many cases of apoplexy, the pulse is sluggish, and the heart seems oppressed.

*Of intermitting pulse.*—Among the most interesting modifications of pulse, which we meet with in practice, is that which arises from impairment of the rhythm of the pulse, or what is called the *intermitting pulse.*

The most common form of intermitting pulse, is that in which the phenomenon of intermission results from the prolongation of the natural period of rest in the series of changes which constitute the heart's rhythm. The heart's rhythm consists of a regular succession of first sound, second sound, rest,—first sound, second sound, rest,—and so on. Now in an intermittent pulse this rest is unnaturally long,—the first sound of one beat succeeds the second of the previous beat, but after too long a pause. Sometimes the intermissions are very regular, occuring after every fourth or every third beat; sometimes perfectly irregular, at one time after every one or two beats, at another every thirty or forty.

Now what are the indications of this form of intermittent pulse? Is it indicative of organic disease? I think I may state positively that an intermittent pulse of itself affords no indication of organic disease of the heart. The phenomenon of intermission is due to some disturbance of the local nervous

influence, upon which, probably, the rhythmical character of the heart's action depends. Nor are we justified in pronouncing unfavourably of a patient because he has an intermittent pulse. You will meet with many persons who will tell you that they have had intermitting pulse nearly all their lives. Take a man in his ordinary health, and discharging his usual avocations,—for example, a medical student,—and suppose this intermittent pulse to be his only notable symptom, then you may set it down, without any hesitation, that there is no organic disease,—neither valvular lesion, nor any organic change in the healthy condition of the heart in any other respect.

But undoubtedly this form of intermitting pulse denotes a derangement of the heart's action of a sympathetic nature, and almost invariably in sympathy with the state of digestion. This kind of pulse is of very common occurrence in men who work hard, neglect exercise, are irregular as to meals, and sit up late at night. It is also very common, and doubtless from the same cause, in gouty men. Intermittent pulse is not uncommonly a percursor of a paroxysm of gout. Certain ingesta are very apt in some people to cause intermission of the pulse. Tea, for example, especially green tea, is one of these: ices, more particularly cream ices, will do the same. So, also, certain medicines,—as digitalis and colchicum.

Of all the causes of intermitting pulse in persons of middle age, or upwards, and in the middle or higher classes of society, I think you will find the gouty state the most common. The *materies morbi* of gout acts upon the nervous system of the heart much in in the same way as the principle of green tea or of digitalis would do, and gives rise to the disturbance which deranges the heart's rhythm: hence in the treatment of these cases, you must endeavour to purify the blood, by regulating the diet and by promoting the excretions, in such a manner as will not debilitate your patient.

I have stated that the intermittent pulse is not a necessary indication of organic disease of the heart. It is a curious fact, which is in some measure confimatory of this remark, that of the various forms of disease to which the heart is subject, intermitting pulse is not of very frequent occurrence with any, nor is it constant to any particular form.

If there is one state of cardiac disease with which it is more frequently associated than with another, I should say it was disease of the mitral valve accompanied by weakness of the muscular fibre of the heart. But a large number of cases of mitral disease will occur without it to one with it; and, therefore, this occasional association gives it no value as an indication. The intermittent pulse depends upon some interference with the healthy nutrition of the muscular system of the heart; and hence you get it so frequently in bad states of the blood,—as in dyspepsia, gout, rheumatism.

You may gather, from what I have stated more than once in the preceding part of this lecture, that there is another form of intermitting pulse besides that to which I have alluded. The characteristic feature of this form is, that the intermission of the pulse does not result from the intermission of the heart's *rhythm*, but from irregularity in the *strength* of the heart's systolic contractions. The heart may never intermit, and yet the pulse may; or, in other words, the intervals between the beats of the pulse may vary considerably in duration. This form of intermitting pulse sometimes occurs alone, sometimes simultaneously with that in which the heart's rhythm is deranged. When it occurs in the progress of an acute disease, as of fever, erysipelas, &c., it must be looked upon as a sign foreboding the worst results. I apprehend that it is this form of intermitting pulse which most commonly accompanies fatty disease of the heart; and, on the whole, in all states of disease, both acute and chronic, it is that form from which we may augur least favourably for the patient.

Posture influences these two forms of intermittent pulse differently. The first form, or that which depends on a prolongation of the natural period of rest in the heart's rhythm, is diminished by the erect posture, and the heart becomes more regular in its rhythm. On the other hand, the erect posture increases the number of intermissions in the second form by embarrassing the heart's action in the way which I have already described.

[In considering the means best adapted to keep down the frequency of the

pulse, we may employ either direct means acting at once upon the heart, or indirect or general means.]

Of the direct means the administration of *digitalis*, or of *opium*, is the most important. You may give digitalis as a diuretic, or with a view to obtain its specific action in reducing the frequency of the heart's action. Given with this latter view it must be administered with due regard to a correct diagnosis, for while it is a very valuable remedy in one case it is a dangerous one in another. I would lay it down as a rule, that in all cases where there is regurgitative valvular disease, but especially aortic, digitalis given in doses which will depress the heart's action is a dangerous medicine; it weakens the heart, and thereby increases the embarrassment under which it already labours; it was for this reason I would not give digitalis in the case of Loveland. In his case, the stream of blood flowing into the auricle meets the blood regurgitating from the ventricle, and the blood flowing into the ventricle has to encounter an obstacle from blood regurgitating into it through the aortic orifice. It will not do to depress a heart labouring under such a derangement as this; therefore the only way in which you can quiet the heart's action in such a case as this is to employ some other medicine, which operates upon the heart through its tranquillising influence upon the nervous system, and so quiets the heart without weakening it. Now, opium is such a medicine, and therefore it is more generally applicable to heart affections than digitalis. The diuretic properties of digitalis may be often called into play in cases of cardiac disease; and for that purpose you may often combine it with a stimulant, as ammonia, or with some preparation of iron, so as to counteract the depressing effects. But the best combination, for a diuretic purpose, is with blue pill and squill, after a formula attributed to the late Dr. Baillie. I have seen, under the use of this combination, considerable dropsy disappear, and the heart become disembarrassed in its action in the most remarkable manner. And it would be impossible to say that the beneficial influence was due to one of the drugs more than to another: it is the combination of the three drugs which many times acts so disadvantageously.

But then there are certain other *indirect* means of acting on the heart, as purgatives, which diminish the quantity of the blood without impoverishing it; or steel, which improves the condition of the blood already poor; rest, the recumbent position, a nutritious and moderate diet, mental quiet. It is generally from the efficacy of some of these remedies, especially the three or four last, that heart cases often experienced a marked alleviation of all their symptoms on their first entering the hospital.—*Med. Gazette, March 7 and* 21, 1851, *p.* 398 *and* 489.

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## 43.—THEORY OF THE FORMATION OF THE VALVULAR DISEASES OF THE HEART.

By John Simon, Esq., F. R. S.

[Mr. Simon regards fibrin not as the nutritive material of the blood, but, with Zimmerman and other physiologists, as the result of the wastes of the tissues, or the decay of the blood itself. We may ask, if this is so, Why is the quantity of chyle greatest in the thoracic duct, having appeared gradually during the progress of the chyle from the lacteals? No doubt many evils result from excess of fibrin in the blood, as fibrinous concretions in the spleen, liver, and kidneys. Mr. Simon even supposes the fibrinous vegetations, on the valves of the heart, so often found in acute rheumatism, and attributed to endocarditis, are owing to this cause; and he asks the important question,—How do those valve diseases originate? He answers it as follows:]

The general opinion, which till very lately has been unquestioned, is, that the lining membrane inflames, and pours out lymph (just as the pleura or pericardium might do,) and that thus these vegetations are true *excrescences* which have arisen in an inflammatory exudation.

Now here on the threshold of the subject, a doubt occurs—Is the lining membrane of the arterial system susceptible of inflammation? "Inflammation," in the language of the schools, "consists in an increased action of the

blood-vessels of a part." Without pledging ourselves for the accuracy of this definition, we may use it in the present instance as a rough criterion of inflammation; at least negatively. No part can be said to inflame, in the ordinary sense of the word, which has not vessels of its own. You cannot talk of inflammation of the hair or nails. What, then, are the blood vessels of the lining membrane of the arterial system, which this theory supposes to be the seat of an increased action? That portion of an artery which we term its inner coat has no blood-vessels of its own, nor do those of the middle or contractile coat (which are derived from the so-called *vasa vasorum*) penetrate to a sufficient depth to influence materially (if at all) the nutrition of the lining membrane.

In the Museum of the College of Surgeons there is a preparation of Mr. Quekett's (an injection done, as all Mr. Quekett's are, with admirable success,) which shows how very much, the *vasa vasorum* fall short of reaching the lining membrane of the artery. And—if you will but think for a moment, what should *vasa vasorum* do there? what could they convey more fit for the nutrition and growth of the membrane than what is already there?—than that blood, namely, which is already washing over it incessantly and profusely.

And again, gentlemen, reflect on this; the lining membrane of the artery and of the valves has an epithelium; wherever epithelium grows, the old cells drop off in a direction opposite to that whence the new ones derive their materials of growth. Just as our scales of epidermis drop from the surface of our bodies, being nourished and renewed from within; just so, if the epithelium of an artery were renewed from without (i. e. by *vasa vasorum*,) the old scales, as fast as they became detached, would drop into the interior of the vessel: and though, no doubt, their decay is very slight, and the number that might thus pass into the circulation, and presently obstruct the capillaries, would be very small, still it would be essentially a clumsy arrangement.

From a variety of reasons, it seems almost certain that the ordinary nutrition of the lining membrane of the circulating system is derived directly from the blood with which it has contact; and that its morbid changes depend—not on any inflammatory condition due to the *vasa vasorum*, but on these humoral changes, those variations in the qualities of the blood, by which it is more immediately and more certainly affected than any tissue of the body.

On these grounds there would be great *prima facie* difficulty in believing that the endocardial deposits could be of inflammatory origin. But this is not all; for if they were inflammatory exudations, why should they be so peculiarly limited to projecting or uneven surfaces of the lining membrane? And why should they evince so decided a preference for the *left* side of the heart? Both sides of the heart, and all points of each cavity, are (one would think) equally exposed to the causes of inflammation; the coronary arteries supply both ventricles of the heart indifferently, and we well know that acute *peri*-carditis pays no respect to the grooves and septum of the heart; it traverses all such lines of demarcation, injects the blood-vessels of right and left side alike, and covers ventricles and auricles equally with its dense inflammatory exudation. On the supposition that these vegetations are inflammatory effusions from the membrane, I should be quite unable to explain why they should almost entirely confine themselves, as they do, to the valvular apparatus; and why their predilection for the left side should be so great, that the right is very rarely affected—perhaps never, except where the left has first suffered, and where the disease has been of such extreme intensity, that even its weaker affinity for the right side has been able to manifest itself.

The opposite doctrine is the more tenable one. I believe that the origin of these vegetations is directly humoral: that they arise as fibrinous precipitations from an overcharged solution; the valves encrusting themselves with fibrin, just as a stick in certain streams coats itself with a calcareous envelope; and that the preferenee shown for the left side of the heart admits of explanation by reference to the peculiarities of its contents—the new-made arterial blood.

You will observe that this theory involves the supposition, that arterial blood is more prone than venous blood to precipitate its fibrin, either as containing more of it, or as containing it in some more separable form.

Not wishing to leave this a matter of uncertainty, I have experimented on the subject. I have carried a single thread, by means of a very fine needle, transversely through the artery and vein of a dog, leaving it there so that it might cut the stream: and I have done this repeatedly, sometimes in the femoral vessels, sometimes with the carotid and jugular, sometimes with the aorta and cava. I have suffered the thread to remain during a period of from twelve to twenty-four hours.

My experiments have given me as a uniform result, that the arterial blood with the utmost readiness deposits its fibrin on the thread; the venus blood with the utmost reluctancy. And in most of my experiments, the thread, where it traversed the canal of the artery, presented a very considerable vegetation on its surface (exactly like those we are talking of on the valves of the heart); a vegetation sometimes as large as a grain of wheat; always of a pyramidal shape, with its apex down-stream, and its base attached to the thread. In the artery, one might say that the thread whipped the blood, just as one whips blood in a basin to get the fibrin out of it; but with this trifling difference, that, instead of the rod beating the fluid, the fluid ran over the rod and precipitated its fibrin there. In the vein, the thread seemed to operate no way but obstructively; never coating itself with fibrin, but sometimes delaying or stopping the circulation with a voluminous black clot, chiefly collected on that side of the thread remotest from the heart. Accordingly, the general statement and rationale of the matter appears to be as follows:—the disease in which these deposits are so frequent is one of intense over-fibrination of the blood, and one in which almost certainly there are other conditions, besides *quantity*, making the fibrin easy of precipitation; the left side of the heart has preference, because it is the arterial side, and because arterial blood, as we have seen, readily parts with its fibrin; the valves, and particularly their streamward surfaces, are chosen for the deposit, because their position exposes them chiefly to the friction of the current; so that the whole curious selection of site for the deposit resolves itself into the concurrence of two conditions, which are fulfilled in that one spot of the vascular system—namely, the greatest chemical tendency to the deposition of fibrin, with the greatest mechanical facilities for its entanglement.

In introducing this subject, I mentioned that it is one of great practical importance. Many people bleed locally, or even generally, when they hear an endocardinal murmur arising in the course of rheumatic fever. In their eyes, the new disease is endocarditis; and everything ending in *itis* is thought, in at least a majority of instances, to be benefitted by bleeding. Therefore do not be in a hurry to call it endocarditis; and, as for bleeding, all that I would venture to say (for of course the treatment of this physician's disease does not fall within my province) is, to assure you of the pathological fact, that you may bleed a patient to death without altering (except probably to increase) the proportion of fibrin in his blood.

I may mention, however, as of some pathological interest, that in a recent work on diseases of the joints, by a French surgeon of considerable experience (M. Bonnet, of Lyons), a section is devoted to the treatment of acute rheumatism by nitrate of potass in large doses (up to an ounce or an ounce and a half per diem). He speaks of its utility in the highest terms, and he quotes with full concurrence a passage from M. Gendrin, who has likewise used the medicine very extensively, to the remarkable effect that this method of treatment possesses this among other advantages, that it prevents inflammation of the endocardium,—*il previent les endocardites*. You will find an interesting paper, on the same method of treatment, communicated by Dr. Basham to the Medico-Chirurgical Society, and published in the last volume of their 'Transactions.'

Now we know that nitrate of potash is a powerful solvent of fibrin; we know that in these large doses a quantity of it must be retained in the blood, and we are thus enabled to interpret the efficiency of the remedy in accordance with our knowledge of the disease. Nitre, if present in the blood in sufficient quantities, would prevent fibrinous concretions on the valves, by increasing the solubility of this material, and diminishing its liability to precipitation.—*London Journal of Medicine, April*, 1851, *p.* 341.

[We cannot subscribe to all these opinions of Mr. Simon, although they seem exceedingly plausible. The reader will find them very well answered by the Editor of the 'British and Foreign Medico-Chirurgical Review' in his April number, p. 472, many of the most important portions of which we give in the 7th article of our present Part.]

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### 44.—CAUSE OF THE MOTION OF THE BLOOD.

By Dr. O'Bryan Bellingham.

[Speaking of congestion as an indirect or secondary symptom of cardiac disease, Dr. Bellingham remarks:]

The cause of the motion of the blood in the capillaries is now generally considered to lie in the impulse given to this fluid by the contraction of the ventricles. An experiment which was performed by Dr. Sharpey seems to confirm this. "A syringe, with a hæmadynamometer, to show the amount of pressure used, was adapted to the aorta of a recently dead animal, the vena cava being divided; warm water was then injected, and, with a force which raised the mercury in the hæmadynamometer only three inches, the water passed through the capillaries, and out of the vena cava. When the pressure was increased so as to raise the mercury six inches, the flow was very free; and on adapting another hæmadynamometer to the vein, the pressure in this was found to rise as high as three inches. The pressure thus used in the arteries (six inches of mercury) was not greater than the natural pressure in the arteries of a living animal; and the pressure transmitted to the veins (three inches of mercury) was greater than that in the veins of a living animal,—thus showing that the force of the heart sustained by arterial tension is quite adequate to effect the circulation without other aid.—*Med. Gaz.*, *Nov*, 22, 1850, *p.* 867.

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### 45.—EFFECT OF ACETIC AND HYDROCHLORIC ACIDS ON PROTEIN.

Mulder says, in his 'Animal and Vegetable Chemistry,' (Part II., p. 307), "The combinations of sulpho-phospho protein (*fibrin* and *albumen*) and of sulpho-protein *casein*, with acids, alkalies, and salts, are especially remarkable. Protein is soluble in weak alkalies. Since therefore the serum of the blood is always slightly alkaline, being a proteate of soda, with sulphur and phosphorus, it keeps the sulpho-phospho protein in solution. This property is the cause of the blood remaining in a liquid state—a chief requisite for animal life.

If a weak alkaline solution of protein is neutralized by an acid, the solubility of sulpho-phospho protein is greatly diminished. The sulphuric and phosphoric acids, by not dissolving protein, stanch bleeding. Acetic acid, by which protein is dissolved, does not, neither does the hydrochloric.

Protein, according to Mulder,—although it is doubted by Liebig,—is a complex substance, consisting of several heterogeneous organic compounds united into one whole, easily acted upon by strong reagents.

If a protein compound be brought into contact with an alkali, ammonia is immediately disengaged, and the alkaline solution can hardly be made weak enough to prevent the disengagement of ammonia. If either fibrin or coagulated albumen be dissolved in a weak potass ley, ammonia is always perceptible. Protein, therefore, is always in a state of decomposition, as serum is alkaline.—*Lancet*, *Feb.* 15. 1851, *p.* 174.

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## DISEASES OF THE ORGANS OF RESPIRATION.

### 46.—ON THE TREATMENT OF PULMONARY CONSUMPTION.

By Dr. John Hutchinson, Assistant Physician to the Hospital for Consumption and Diseases of the Chest.

[Dr. Hutchinson remarks that, although fine air, warm clothing, nourishing diet, and regular hours, are absolute essentials in the treatment of pulmonary consumption, and that close confined situations, ill-ventilated chambers or localities, irregular hours and deficient nourishment, are the very worst conditions for such patients, yet that there is no greater mistake among mankind

than the belief that an atmosphere warmed by a stove is, from its equable temperature, therefore proper for the respiration of consumptive patients. As the most striking symptom in consumption is the constant wasting away, so the most remarkable medicine of the day for increasing the weight is cod-liver oil. So great is Dr. Hutchinson's confidence in this drug, in its power of arresting consumption, that he states his belief that more benefit is derived from its use, where it can be borne, than by the most careful consultations and the command of all the other medicines in the pharmacopœia. Of its power of increasing the weight, he says:—]

Some very remarkable instances of great increase of weight have presented themselves,—thus, in one instance, 41 ℔s. were gained in 16 weeks; in another, 19 1-2 ℔s. were gained in 28 days, and 10 ℔s. in the succeeding 10 days; in another case, 29 ℔s. were added to the patient's weight in 31 days." "Amelioration of the symptoms did not invariably follow an increase of weight, though the exceptions were rare." "In other cases, where the melioration was still more considerable and the progress of the disease appeared to have been stayed, relapse occurred, and was followed by a rapid progress to a fatal issue." "An aggravation of the symptoms and a diminution of the weight were almost invariable coincidences." "In a few cases the symptoms improved, though the weight remained stationary, or even became slightly diminished."

It is worthy of remark that, in many cases included in the 18 per cent. as arrested, they felt themselves as well as they had been before the attack of the disease, and few of these patients returned to the hospital again, therefore it is not unfair to presume that their "improvement was permanent." It is the opinion of the officers who drew up this report, in expressing their opinion upon the value of cod-liver oil, that it "possesses the property of controlling the symptoms of pulmonary consumption, if not of arresting the disease, to a greater extent than any other agent hitherto tried."

We have noticed that this medicine may be tried in any stage of the complaint, or rather, we should say, in any stage of pulmonary disorganization.

An opinion has been entertained that the administration of cod-liver oil causes a recurrence of hæmoptysis; this impression does not gain ground in our opinion; but the question is not easy to answer, because hæmoptysis is of such frequent occurrence, particularly in the early stage of the disease. The oil certainly does not excite diarrhœa nor hectic fever; probably, by a continuance of it for many weeks, with inattention to the bowels, temporary hepatic derangement may manifest itself; but, unless these symptoms supervene, it may be tried at any time, even when there is a preternatural heat of the skin and quickened respiration. There is one case now under our care, a child about eleven years of age, who appears to be at the eleventh point of the last stage. She has for many weeks past taken *nothing* but cod-liver oil for her daily food, her bodily sustenance, and support. She is a perfect object of emaciation, of pulmonary disorganization, and prostration of strength.

We commence the oil in small doses of ʒj three times a day, and seldom exceed ʒiv per dose; in fact, we do not think that the benefit to be expected is relative to the extent of the dose; we have seen a man gain 28 lbs. in weight on the small dose of ʒj three times a day. The stomach is apt to reject a large dose; indeed, common is the rule, that a uniform effect of a medicine is not commensurate with the extent of the dose; a speck of vaccine virus saves a man from small-pox.

In some few cases in our hospital it has been given to the extent of ℥iss for a dose. The oil used is of a straw colour, transparent, and free from all offensive smell; children take it easily. Darker coloured oils will have the same effect, but they are offensive, and patients consequently object to them. The oil is often taken in simple water, camphor water, or any aromatic water or bitter infusion, or in milk; when it cannot be taken in this way, it can often be tolerated as a mixture of ʒj of the liq. potassæ, or ʒij of the pulv. tragacanth. to ℥iss of the oil in ℥viss of peppermint or anise-water,—an ounce of either mixture being taken three times a day. Such will often remain in the stomach when the other forms cannot be taken. When none of these can be

borne, benefit is sometimes derived from a mixture of ʒiss of spermaceti to ʒij of tragacanth and ʒvj of pimento-water, administered in the same dose. When the oil has been taken for some time, and a repugnance on the part of the patient suddenly arises against it, some simple "cough mixture" will "do wonders" in keeping things quiet for a time, when the oil can be again resumed. We have known the oil to be taken three times a day for nine months without any intermission.

There is one common question which we ask, "How do you rest at night?" and as common almost is the answer, "I cannot rest at all for coughing." We make it a rule to quiet the cough and to command sleep, for, if the patient cannot sleep, hectic symptoms may supervene, and little good without rest can ever be expected from the oil or any other medicine. Anodynes of some kind are consequently resorted to and often gr. iv. of the extract of hemlock, with gr. ss. of ipecac., and gr. ½ of muriate of morphia at bed time; or, indeed, we prefer a pill of gr. one-sixth or gr. ¼ of muriate of morphia at bed time, increasing the dose as may be found needful. We try to give as little opium as possible, but the cough must be quieted, and sleep must be obtained.

The next important point is counter-irritation. We are convinced that it is a most valuable measure to keep up external irritation on the thoracic region. How often do we see in practice, that the closing up of some old discharging wound immediately excites phthisis,—the counter-irritation being removed, the latent phthisis manifests itself; and how rarely do we see (as Dr. Cotton noticed to us) skin disease associated with phthisis; indeed, we are glad to see a "rash break out" in a consumptive case. We sometimes produce counter-irritation with cantharides, but we prefer a solution of iodine, as ʒj of iodine and iodide of potass. to ʒij of rectified spirit of wine, laying it on with a piece of sponge on the end of a stick; and this may be done in a few seconds of time. This immediately sets up an irritation in the skin. We use it freely upon either sex, first upon one and then upon the other side of the chest, even if one lung only is affected. Counter-irritation should only be employed when the system is quiet. We have now noticed four great points in the treatment—to increase the weight, to sooth the cough, to procure rest, and to set up counter-irritation: this is what we try to maintain; but, unfortunately, so many collateral symptoms lie as it were ready to present themselves, when we think things are going on quietly, that any regular course is always liable to be interrupted, so many and so complicated are the peculiarities; in truth, we may say no two cases are alike, so that every modification of treatment is at times required, and this, in a sketch like the present, we cannot consider. For instance, if hectic fever supervenes, neither cod-liver oil nor counter-irritation can be continued, and the case must now be met accordingly; again when it commences we commonly suspend the oil, and always so when hæmoptysis appears.

When hæmoptysis occurs we suspend the use of the cod-liver oil, for the usual treatment with sulphuric acid, or acetate of lead, and the compound ipecacuanha pill, with cold and low diet, &c. We have heard *strongly* recommended dry cupping the thoracic region; but, of this, we have not yet had any experience, at least not more than such as to induce us to feel favourably inclined towards this treatment; the more so, as the trial cannot do any harm; also, oil of turpentine in small doses of mx three times a day.

Diarrhœa is another symptom, during which we generally suspend the use of the cod-liver oil for those soothing or astringent mixtures, commonly known as containing chalk, opium, and catechu, &c. This symptom is peculiar as to its duration; some patients always have a tendency to it, while others never have it; contrary to hæmoptysis, its liability to return increases with the advance of the disease; the coats of the arteries resisting ulceration in a remarkable degree, while the other tissues of the lungs are removed and cavities are being formed. When the diarrhœa continues long and is obstinate, the oil is commonly resumed again, upon that well-known principle of a medicine acting differently at different stages of a disease. When "night sweats" supervene, we certainly derive great benefit from the administration of gallic acid, gr. v., with the one-eighth of a grain of muriate of morphia, as a pill, at bed-time.

In a brief sketch like the present, upon the general treatment of pulmonary consumption, it will of course be recollected, that innumerable combinations of disturbing causes supervene, which arrest the general principles of treatment, which cannot here be mentioned, but which must be met, according to the general knowledge which all possess; but the chief points are to arrest the wasting counter-irritation, and quieting the cough. No day passes in examining the mass of patients, but that the most interesting and inexplicable conditions present themselves, so that we experience constant checks to generalising; for false generalisation is commonly upset, as soon as formed, by twenty or thirty consecutive cases immediately appearing: for instance, the question as to the cod-liver oil producing diarrhœa, was uniformly answered by the negative in nearly forty consecutive patients of both sexes.—*Med. Times, January* 4, 1851, *p.* 5.

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## 47.—CASE OF PNEUMO-THORAX, WITH TUBERCULAR CONSOLIDATION OF PART OF THE LUNG.

By Dr. R. B. Todd, F.R.S.

[The pneumo-thorax in this case arose from perforation of the lung. The patient, Thompson, æt. 39, a man of phthisical aspect, was admitted nearly a month before suffering principally from dyspnœa. About seven weeks before this he had an attack of hæmoptysis. The *quantity* of blood in hæmoptysis is of secondary importance as regards the diagnosis of phthisis: it may be a mere streak, an ounce, or a pint; the *fact* is very material, and the continuance of the hæmoptysis, or the frequent repetition of it, is of great importance. Dr. Todd continues:]

When we came to make a minute examination of him, we found that the principal spmptoms were pain below the right scapula, occasional cough, and constant shortness of breath; and the physical signs were such as to denote disease of the base of the right lung. Percussion over all the inferior portion of the back of the right lung yielded a dull sound, and over all this region well-marked bronchophony and bronchial breathing were audible, except at the very base, where the bronchophony was supplanted by ægophony, and where there was a total absence of all breath sounds. On applying the hand over the region where the ægophony was heard, vocal vibration was found to be absent; over the region marked out by the bronchophony it was perceptible, but was less strong than on the left side.

Now I take it for granted that you all know the value and indications of these signs,—that bronchophony denotes that the lung intervening between your ear and some of the air-tubes of the lung possesses the power of conducting sound in an undue degree, from some form of increased solidity; that vocal fremitus indicates the contact of the lung with the thoracic parietes at the part where it is felt; and that ægophony denotes a stratum of fluid intervening between the ear and the lung, through which voice sounds have to pass, and by which they are modified. In the ordinary healthy condition the voice passes at once from the lungs through the parietes of the chest to the ear of the auscultator; but, where there is any fluid in the pleural cavity, the vocal vibrations have to pass through lung, fluid, and thoracic walls before they reach the ear. If there is much fluid, the lung is so compressed that it ceases to be a conductor of the voice sounds; it is pressed up against the spine, and the vocal vibrations created in the larynx cannot be propagated by it to the walls of the chest; therefore ægophony indicates not only the presence of fluid, but shows that the amount of that fluid is small. When you have pleuretic effusion you must, to a certain extent, have compression, and therefore some consolidation of the surface of the lung; hence, whenever you have ægophony, you generally have a certain amount of bronchial breathing; but the bronchial breathing, if existing only in this proportion, merely results from the compression, and is not indicative of any deposit in the substance of the lung. In the present case, however, the bronchial breathing was so distinct, and existed so far above the space to which the ægophony was confined, that we diagnosed not only pleuritic effusion, but consolidation of the lung, either by hepatization or by tubercular deposit.

Well, the case went on with a morbid tardiness. The fluid became absorbed, and the physical signs underwent a corresponding modification; the bronchial breathing and bronchophony continued, but the ægophony almost disappeared. On the 22d., more than three weeks after his admission, I could hardly say whether there was ægophony or not; the bronchophony had an ægophonic character, but whether it deserved the name of ægophony I could hardly determine.

You may remember, in my observations on the case as I went round the wards, that I noticed the obstinacy with which the state of solidification resisted the action of medicines. I felt sure there was something that kept up this state. You know that, in ordinary cases of hepatization of the lung in persons otherwise healthy, the solidification resolves itself pretty quickly, often very much so,—I have known hepatization appear and disappear in twenty-four hours; but here, although we used nearly all the armature of physic,—although we mercurialized him, and iodized him, and treated him with all that range of remedies supposed to be efficacious in promoting the reabsorption of effused matters,—still it persisted; and you may remember I was very anxious to know the cause of this obstinate continuance. If there were no signs of tubercle elsewhere, the fact of its being the lower part of the lung that was solidified was against the supposition of phthisis. We examined the upper part of both lungs carefully on several occasions, but we could find no evidence of tubercle in either; still I entertained suspicions that the case was phthisical, and these suspicions were increased by the early history of the case: the hæmoptysis, the cough, the loss of appetite, the sweating at night, the dyspnœa,—all pointed to this; and finding it so obstinately resist remedies would of itself have excited strong suspicions in my mind, even in the absence of other evidence.

On the 24th, having left him at my previous visit much the same as he had been for many days, with a pulse of 110, and breathing pretty tranquilly, we find him suddenly seized with extreme dyspnœa, performing fifty respirations in a minute: great pain in the right side, which came on suddenly with the dyspnœa: an anxious expression, and blueness of the surface. On examining him to find out the cause of the sudden dyspnœa, I found that the respiration was very imperfect on the right side, while it was puerile on the left; that, on percussion, while the upper part of the right lung was normally resonant, the lower part had ceased to be dull. but was instead remarkably tympanitic: and finally, when I came to examine more minutely, I found that the breathing in the upper part of the lung was vesicular, whilst in the lower part, in the region corresponding to the tympanitic percussion, the sounds of respiration were almost lost, what remained having a bronchial character; and that they were accompanied by that peculiar metallic sound, like blowing into an empty barrel, to which the name of *amphoric resonance* (bourdonnement) had been given. These were exactly the signs which I found on Sunday,—this was just the condition of the right side. Now, if all this had occurred on the left side, there might have been a source of fallacy from the presence of the stomach on that side: an empty stomach much distended with air would have produced analogous phenomena, as far as regards the percussion; but on the right side this source of fallacy does not exist; and the only thing that might cause an approach to these physical signs would be an enormously inflated transverse colon: but this would hardly produce an approach to what we find in the present instance, as far as regards the physical signs; the tympanitic percussion-sound would not extend so high in the chest, nor would it have been confined to the chest, and we should have found a great portion of the abdomen similarly affected.

The most probable explanation of the phenomena, then, will, I think, be derived from assuming that air had suddenly found its way into the cavity of the pleura. You are aware that air never exists naturally in the pleura, but that the two surfaces—the parietal or costal, and the visceral or pulmonary—are in immediate contact. The question then arises—how did the air get in? What could have caused this strange phenomena? It is very probable that air may be secreted by the pleura: there are high authorities who maintain

the existence of such cases—cases in which air is found in the pleura with a manifest absence of any aperture, either external or internal, by which it could have obtained ingress: or air may have been generated in the pleural sac by the decomposition of fluids previously existing there.

Now without discussing the interesting pathological question—whether air may be developed in the pleura in either of the ways I have just mentioned—I must content myself with stating that either mode of the development or generation of air would not give rise to the *sudden* manifestation of the severe symptoms such as took place in our patient Thompson, on the 24th of November. The pain and oppressed breathing might have come on quickly, but not suddenly; nor would the physical signs have developed themselves so rapidly as in Thompson's case.

We must, then, look for some other explanation for the sudden appearance of air in the pleural cavity: and I think we shall have no great difficulty in finding it. Now we know that perforation of the lung and pulmonary pleura is not an uncommon occurrence; we know when it does occur, and a communication is thus established between the pleural cavity and the air in the lungs, that a certain amount of air is drawn into the cavity of the pleura at each inspiration, more or less of which is retained there, the quantity augmenting by a regular increment at each inspiratory act, with a rapidity proportionate to the size of the orifice; that, as the quantity of air increases, the lung undergoes compression, and the chest dilatation; so that, in some instances, the lung may be at length rendered incapable of respiration, being pressed back against the spine, as we often find to be the case under fluid.

Now what have we in the present case consistent with such an explanation as this? We have previously-existing disease of the lung, sudden accession of dispnœa, sudden tympanitic condition of the chest, diminution of respiratory sounds, loss of vocal fremitus, and, more conclusive than all, the addition of a peculiar characteristic sound, which sound is heard in the situation of the previously-existing disease.

The most probable conclusion that I can come to is, that either from pneumonia a superficial abscess has been formed, which has burst by the giving way of the pulmonary pleura, and so opened a communication between the lungs and the pleural cavity; or, what is much more probable, that the same condition had been brought about by the softening and breaking down of tubercular deposits, one or more, situated immediately beneath the pleural surface, having given way, and so produced the opening: this seems to me the most probable explanation of the case. You know that what we have to account for is the sudden accession of the dyspnœa and other symptoms, the tympanitic condition of the chest, and the amphoric blowing: for all these phenomena my hypothesis accounts, and for them no other that I know of would; and experience tells us that the majority of cases of pneumo-thorax are thus produced.

It is true that if a portion of lung was solidified, and a stratum of air interposed between it and the wall of the chest, the bronchial breathing would be rendered amphoric by the interposed stratum of air; and this intervention of air might arise from rupture or from secretion.

It may seem against the supposition, that the cause of the rupture is softened sub-plural tubercle, that the amphoric blowing, and therefore the opening, is at the lower part of the chest; but, although, this rather weakens the probability, it certainly does no more, since turbercles are occasionally met with exclusively in the lower part of the lungs; and it by no means counterbalances the other symptoms in the early history of the case, which seemed to indicate its phthiscial nature.

Now if anything were to occur to plug up the opening, the amphoric blowing would cease, provided the lung were not solid. If it were solid, the bronchial breathing would put on the amphoric character. You will remember that in this case we had already, before the occurrence of pneumo-thorax, diagnosed solidification of the lowest lobe of the right lung.

Sometimes gangrene of the lungs will give rise to such a train of symptoms as have been above enumerated: an eschar will form, involving the pulmonary

pleura, and thus forming a communication between the lung and the pleural cavity; but the great diagnostic sign of gangrene of the lungs—fœtor of the breath—is here absent: that supposition must, therefore, be negatived.

Now what will be the probable progress of this case? At present we have only one sign which may be called truly pathognomonic and characteristic—the amphoric blowing. Before the case terminates it is possible, and not improbable, that we shall have more, or at least one other. The particular sound to which I refer is the *metallic tinkling*—a name which it has received from its sharp ringing character: it is caused by the dropping of fluid from one part of the chest into another through the air contained in the cavity of the pleura. If the patient lies down, the surface of the lung becomes bathed in the fluid: if he then suddenly rises, the fluid gravitates to the bottom of the chest, and that portion with which the surface of the lungs is wetted, falls in successive drops into the fluid below: by communicating sudden movements to the chest, a splashing sound may be produced, of an exactly analagous nature. Metallic tinkling cannot take place unless *air and liquid co-exist* in the chest; it depends upon the agitation or dropping of fluid in a cavity occupied by air: hence we do not get metallic tinkling in those cases of ordinary liquid effusion which follow pleurisy, because there is no air; and we do not get it in those cases of pneumo-thorax which sometimes, though rarely occur, where there is no other effusion, because of the absence of the liquid.

There is one condition that may simulate this, and that may be, without great care, confounded with it,—a condition that may be evinced by identical physical signs, and in which we must resort sometimes to other than the physical signs for the diagnostic marks. Sometimes a large cavity is formed near the surface of the lung by the breaking down and expectoration of tubercular matter, such a cavity will contain within it all the conditions necessary for the productien of metallic tinkling and amphoric resonance,—namely, a large amount of air, a certain amount of liquid, and one or more openings through which air is ever passing into the cavity. The present case cannot be one of that kind, because the dyspnœa and amphoric breathing came on so suddenly;—because the area of the tympanitic percussion is too extended,—and because there has been no gurgling or cavernous breathing.

What we have to do in watching this case is to look out for the appearance of metallic tinkling, and for any change that may take place in the amphoric blowing—in other words, to look out for the formation of fluid by a pleuritic state consequent upon the introduction of air: or, on the other hand, we must look for the disappearance of these signs, and the removal of the air by absorption, the opening in the lung being closed either by a healing process or by being plugged up by tubercular or other matter. The long continuance of the signs of consolidation previous to the occurrence of the pneumo-thorax, and their persistence in spite of all modes of treatment, precludes the idea of the existence of simple pneumonia; and the previous history is so favourable to phthisis that I fear we must let our prognosis rest upon that, and be prepared for the gradual sinking of our patient from the extension of tubercular disease—the softening of tubercles—the embarrassment of breathing—the hectic.

Whatever view we may take of the case, it is clear that but little is now to be done by the interference of art. To open the chest with the idea of giving egress to the air promises nothing, as the probability is that the air thus evacuated would be quickly replaced by other air less suited to the pleural cavity by its temperature and moisture, than that which had previously passed through a certain portion of the air-passages. If we were to tap in such a case, we should have two apertures into the pleural cavity instead of one, and should not be a step nearer the eradication of the cause of the malady. The course which I have pursued with this patient has been to keep his thorax firmly bandaged, in order in some degree to limit undue distension of the chest by the accumulation of air in the pleura; and I have also kept him under the influence of opium, with much the same view as I should adopt the same plan in a patient threatened with peritoneal inflammation after some operation opening the sac of the peritoneum, or after perforation of the intestine. He bears the opium well, and I

think it exercises a favourable influence upon him. His respirations are less frequent, and the pulse does not exceed 110; and he is enabled to take a fair amount of nourishment. It is now six days since the sudden appearance of the symptoms of pneumo-thorax, and no evidence of the formation of fluid has appeared.—*Med. Gazette, Jan.* 31, 1851, *p.* 177.

## 48.—ASTHMA.

By Dr. R. B. Todd, F. R. S.

*What is Asthma?*—I shall answer this question by stating first that it cannot be properly called a disease of the lungs—in other words, its primary seat is not in the lungs: it may be defined to be a constitutional disease, which manifests itself by paroxysms of difficult breathing, with intervals of various duration, in which the patient is completely or nearly in a healthy condition.

Let us look at the more prominent points in the clinical history of asthma, and inquire how far we may found upon them an explanation of its pathology.

The way in which the uncomplicated asthmatic attack commences is generally this. A patient, we will say, goes to bed quite well: soon afterwards he finds a difficulty of breathing come on; he cannot lie down; he cannot go to sleep; the dyspnœa increases, and the attack becomes confirmed: or, what is very often the case, he goes to sleep quite well; and wakes in an hour or two with the attack on him. When once formed, the asthmatic paroxysm continues for some time, and passes off generally with some cough and expectoration, but sometimes without either. The time of its duration is very variable: sometimes it lasts only a few hours, sometimes many days.

When suffering from the attack the patient cannot lie down. All asthmatics show an instinctive repugnance to the horizontal posture while the attack is on, and even in the intervals of the attacks they like to lie high, and seldom lie quite flat: generally they are content with sitting up in bed or on a chair, or they may sometimes move about the room. The coachman of a neighbour of mine some years ago suffered so much from a paroxysm of asthma, which resisted all treatment, that he was obliged to stand leaning forward on a table for three days; and in this erect posture he passed the whole of this time: at last he became so exhausted that he wss obliged to sit down from sheer inability to support himself. The erect or semi-erect posture is no doubt preferred because it enables the muscles of respiration to act with greater freedom, and with more mechanical power.

These attacks are very much influenced by weather, particularly cold and damp, and by locality, as high or low, humid or dry, relaxing or bracing; and there is a remarkable capriciousness in these respects, some persons liking a low, damp, smoky situation, some a high, dry, and clear; that which is fatal to one case will be the very best thing to another, and one person will be well where another cannot live. Sometimes persons living in London, and wishing to try the neighbourhood, will ask you, "Shall I go to Clapham, or shall I go to Highgate—will a high or a low situation be the best for me?" Now this is a question that it is impossible to answer with certainty; for very often that which would seem the worst will turn out the best. I have known asthmatics better on the banks of the Thames than anywhere else; on the other hand, I have known some greatly relieved by going to a high situation. Dr. Watson has some interesting remarks on this subject in his valuable lecture on asthma, and relates some curious cases in illustration of the uncertain influence of locality in checking or promoting the asthmatic paroxysm.

Then, sometimes we find that asthma is brought on by certain specific irritating agents. We all know of *hay-asthma:* that if certain individuals venture within the range of a hay-field, they are seized with sneezing, coryza, profuse lacrymation, and other symptoms of irritation of the mucous membrane, accompanied with a distinct asthmatic paroxysm. Similar symptoms are brought on in other people (but such persons are much fewer) by the volatile effluvium of ipecacuan, or by the presence of very fine particles of dust floating in the atmosphere.

In asthma the respiratory efforts are greatly exaggerated, in consequence of

the sensation of the want of breath—the *besoin de respirer* of the French; a sensation which any one may easily experience in his own person by simply putting his face into water for a few seconds. Under the influence of this strong feeling of the want of breath, large quantities of air are drawn in, and so great is the effort of inspiration that the noise which it occasions may be heard for a considerable distance. What results? The air-cells of the lungs become dilated, and the whole lung experiences a proportionate enlargement, and the external configuration of the chest is altered.

The state of lung which is produced by asthma is that which has been called by Laennec *emphysema*—a name not happily chosen, as it implies what really does not exist, namely the infiltration of the lung with air, the existence of the air in is extravesicular tissue. If the asthmatic attacks continue for any great length of time, and are severe, we find further injury of the lung taking place; the walls of the air-cells suffer in their nutrition, and some of them, already dilated to their utmost extent, give way; three or four, or more, become fused into one, and form large irregular cavities, which are distributed among the healthy pulmonary tissue.

But, besides these changes in the lungs, the repetition of the asthmatic paroxysms leads with equal certainty to morbid changes in the *heart*. From the obstruction that is offered to the circulation through the lungs an undue amount of work is thrown on the right ventricle, which of course becomes more or less hypertrophied; at the same time the meshes of the pulmonary capillaries become enlarged, and no doubt experience some change in their vital properties whereby the circulation in them is retarded. This affords an additional means of obstruction through the lungs, and therefore an additional cause for hypertrophy of the right side of the heart. But as the backward pressure of the blood on the heart becomes increased, the right ventricle becomes not only hypertrophied, but dilated, and the dilitation extends in a retrograde course to the auricle, and thence to the large veins, so that in the advanced stages of this disease it is not uncommon to find venous regurgitation, and more or less congestion, throughout the whole venous system. In the early stages, however, none of these conditions will exist. You may have the most exquisite asthmatic dyspnœa without its leaving any perceptible deviation from the healthy standard either in the heart or lungs, or at most no more than may perfectly recover itself when the paroxysm passes off. This is more likely to occur in children, because their tissues have a greater power of recovery from their greater activity of nutrition.

Such cases as these would alone be sufficient to prove that asthma is a disease essentially independent of any organic lesions of heart or lungs, though frequently accompanied by them, aggravated by them when they exist, and always *inducing* them if it is of sufficiently long continuance. And it is remarkable how soon these lesions may be thus induced, how short a continuance of asthma will be sufficient to give rise to evident signs of organic change in the heart and lungs.

[In this case, although the patient only had asthma three months, and for the greater part of the time not severely, yet he is already found with a barrel-shaped and unusually resonant chest, dilated thoracic parietes, and the heart so displaced and dilated in its right cavities as to beat in the region of the scrobiculus cordis. Dr. Todd continues:]

I look upon this last sign as one of the most characteristic symptoms of asthma, and I consider its presence in any case where I suspect asthma as a clear configuration of the correctness of those suspicions. In accordance with this view, in examining a patient whom I suspect to be asthmatic, one of my first steps is to apply my finger to his scrobiculus cordis: if I find no beating of the heart there, my conclusion is a contingent negative; but if I find it beating there, and not in its natural position under the nipple, my conclusion is a certain affirmative.

If you trace up the disease to the point of its first appearance, you will generally find that the first attack came on either without any assignable cause, or after some indiscretion as to diet—or after some imprudent exposure to weather; the patient went to bed well, and in every respect in his usual

health, and woke up asthmatic,—but once having made its appearance, it renders its victim ever after liable to its recurrence.

A remarkable circumstance is, that it is often inherited: the father or mother have had it, or it may have leapt over a generation,—the grandfather may have been asthmatic, and the intervening generation not so. Once that the asthma has fairly established itself in any individual, it may be brought on by any slight cause, even the most trivial disturbance, will be sufficient to excite it,—catarrh, indigestion, irregular hours, mental excitement, violent exercise, change of temperature, change of place—any one of these may bring on an attack. Now, if you inquire narrowly, you will generally find at the root of the disease some fault in the primary assimilation: you will find that the patient has learned to avoid certain things: that he is not at liberty like other men; there are some things of which he dare not partake, or, if he does, it is done at the price of an attack. And you will likewise find, on looking into the patient's secretions, that they are altered, that the urine is lithic, phosphatic, (most frequently the former), or presents some deviation from the healthy standard. Very often too, you will find the attack ushered in by a peculiar condition of the urine, either such as I have just mentioned, or urine resembling nervous hysterical urine, abundant, clear, and pale, and of very low specific gravity.

Now all these points,—the periodical recurrence of the attacks, the perfect, or nearly perfect health in the interval, the absence of any organic change, the associated humoral disturbances,—all bear in the most interesting way on the pathology of this malady. They tend to establish a remarkable analogy between asthma, gout, and some other diseases. As in asthma, gout comes on quite suddenly—there is no warning: a man may go to bed quite or nearly well, and he will wake up early in the morning with a fit of the gout in his great toe. There is another disease, epilepsy, in which we have exactly the same phenomenon: a patient with or without warning, falls down foaming, livid, and convulsed; the paroxysm goes off, and leaves him in his ordinary good health, and he may go on for years and not have another. Again, we know that a fit of the gout leaves no organic lesion if it occurs once or twice: but if it is often repeated, it leaves permanent injury in the joints that it attacks. We may observe the same with respect to epilepsy. If a patient has suffered only one or two attacks, you will find no change in his brain; but if he has had several, you will. The disease evidently consists essentially of something *attracted to* the brain, and not *existing in* it. The same, too, of asthma, the organic changes are all secondary, and a few attacks leave no traces behind them.

All this leads us to suppose that the paroxysm of asthma has something in common with the paroxysm of gout and the paroxysm of epilepsy. Of the two, I prefer to take the analogy to gout, because we have more definite and coherent ideas about gout, and we are more acquainted with its exact pathology. The theory at present most in favour with regard to gout is that it is a disease of assimilation, and this defective or vitiated assimilation gives rise to some materies morbis. When this matter is eliminated from the system, the attack passes off; when it accumulates, the attack comes on. In asthma, defective assimilative power is a frequent coincident. Gout, too, and rheumatism, and all humoral diseases, resemble asthma in being inherited.

When the materies morbi of asthma has been generated, its effect is to irritate the nervous system, not generally, but certain parts of it, those parts being the nerves concerned in the function of respiration—viz., the pneumogastric, and the nerves that supply the expiratory muscles, either at their peripheral extremities, or at their central termination in the medulla oblongata and spinal cord; extreme difficulty of breathing is the result, and as a consequence of this, ultimate disease of the lungs.

Thus the occurrence of asthma in paroxysms would be accounted for much in the same way you would explain the occurrence of gout in paroxysms; and in the intervals between the attacks, the patient, being of asthmatic constitution, so to speak, is easily thrown into the paroxysm of asthma by causes which would but slightly influence other men—as cold, impure air, mechanical irritation of

the respiratory passages,—just as gouty men may have patients who have emphysema gouty paroxysm by causes comparatively trivial. affirmatory of this view, that

This seems to me to be the most reasonable exposition as had few attacks of asthma.

Now we often hear physicians of great and deserved reputation; the asthma *premodic* asthma. I need not tell you that the bronchi possess a consisting of circular fibres of the unstriped, for it has been lon only by microscopical observation, but by the most satisfactory ex It is in these circular muscular fibres of the bronchi that many patholo calize the spasm, to which they ascribe all the phenomena of asthma.

The first link in the chain of effects of the immediate exciting cause of as ma would be, according to them, spasm of the bronchial tubes, then dyspnœa. Undoubtedly a state of spasm of the bronchial tubes would produce a great deal of dyspnœa; but what I want to point out to you is, that this state of spasm of the bronchial tubes ought rather to be regarded as one of the accompaniments, one of the phenomona of asthma, than its cause. The feeling of breathlessness, or, in other words, a peculiar state of certain nerves and of a certain nervous centre, the centre of respiration, is the first link in the chain of asthmatic phenomena. The spasm of the bronchi follows sooner or later upon this, and often it follows so quickly upon it as to appear to come simultaneously with it: does it ever precede it? I doubt this.

Undoubtedly you may have severe asthma without severe spasm of the bronchial tubes. I remember a well-marked instance of this in a gentleman whom I attended for chronic disease, cancer, as I thought, of the liver. For nearly a week before his death he suffered from the most frightfully distressing asthma, which nothing could control, and which lasted without interruption till he died. I examined his chest repeatedly at all parts, and could hear nothing but the most perfect, loud, and puerile breathing, which is quite inconsistent with a state of spasm.

Again: section of the vagi nerves of animals produces phenomena exactly like those of asthma. Whatever be the cause of the dyspnœa in these cases, it is clear it cannot be bronchial spasm, as the muscles of the bronchi would be paralysed after section of their nerves.

There is one thing that I have observed, which has an important bearing on this subject; that in that particular form of spasmodic disease which I have no doubt in your future practice you will have many opportunities of witnessing, laryngismus stridulus, the crowing inspiration of children, there is a ronchus all over the chest, simultaneous with the convulsive attack. The moment the convulsion comes on, when the eyes become fixed, and the child begins to inspire with difficulty, if you put your ear to the chest you will hear a ronchus pervading the whole lung. The moment the recovery takes place, the ronchus ceases. And it is very interesting to notice that you may observe the very same thing in the ordinary convulsions of children, in which the larynx is not prominently engaged; and I suppose no one will pretend to locate these diseases anywhere but in the nervous system.

Hence the conclusion that I draw is this, that the spasm is the accompaniment, and not the cause of the difficult breathing that accompanies or follows upon the nervous changes, just as it does in laryngismus and in the ordinary convulsions of infants.

So much for the pathology of asthma; as to the treatment of this disease our attention must be directed,—1. To obtain relief to the paroxysms, and,—2. To improve the patient's constitution in the intervals of the paroxysm.

First, in the asthmatic paroxysm you must enquire into the immediate exciting cause, and endeavour to remove it. With this view an emetic, by emptying the stomach, will often be found useful; or if the quality, not the quantity of the contents of the alimentary canal is the source of the evil, an alkali will be found beneficial. Stimulants are sometimes of essential service, especially when the long-continued circulation of imperfectly arterialised blood has deadened the sensibilities, and so far lowered the powers as to render the expectoration of mucus difficult: one of the best stimulants is sulphuric ether, or perhaps the chloric is even better, from its taste and smell being so agreeable.

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Lastly, we know how in cases ... the asthmatic paroxysm in chloroform: is all those functions which are ministered to by nervous influence, and in its efficacy in asthma we have an interesting physiological experiment, and an important lesson with regard to the true pathology of the disease. But in the administration of chloroform I would give you this two-fold caution:—first, to give it gradually and cautiously, and not in a full dose; not to produce insensibility, especially if there be anything like blueness on the surface, because, though remedial to the asthma, it will tend to increase those very consequences which are most to be feared from the circulation of venous blood. Secondly, to impress upon your patient that he must never give it to himself, nor without the presence of a medical man. This case was related in the papers the other day:—A person who was in the habit of curing his attacks of asthma by inhaling chloroform, when administering it to himself one day, and when in a state of half subjection to its influence, to produce the full effect placed his handkerchief on the table, and buried his mouth in it; his insensibility became deeper and deeper, till at last he was too far gone to be able to raise his head. He therefore continued inspiring it, his coma became more and more profound, and a short time after he was found in that position quite dead.

Secondly, the treatment of the intervals between the paroxysms should be directed to improve the digestive powers of the patient and the tone of his nervous system; the diet should be very carefully regulated, both as to nature and quantity; and this is of all things the most important to occupy the attention of the medical attendant. The alimentary canal and the secretions generally should be kept in a healthy condition; exercise, the hours of rest, and in fact everything that bears on the general health, should be systematically and rigidly superintended; and I am sure that treatment of this sort will always be found of substantial advantage. Another thing having the same object is cold or tepid affusion, either by sponging or by shower-bath; but cold, while very serviceable to those who can bear it, is often too much for many people, in whom no reaction takes place, the coldness continues and drowsiness is produced. Such symptoms should always be looked upon as contra-indications to the use of cold affusion.

Now before I conclude, I will say a word on the relation of emphysema and asthma. Are these two diseases related to one another as cause and effect? and, if so, which is the cause, and which the consequence? To determine this let us see what emphysema is. It is a state in which the lungs are rendered more capacious, in which the relation of the ultimate elements of the lungs are in some measure deranged, and the pulmonary capillaries altered. Now, is this state of increased capacity a state capable of producing such a dyspnœa as we see in asthma? I cannot think that it is, although this increased capacity is attended with other conditions tending to diminish the efficient aeration of the blood, and, therefore, to the production of dyspnœa. But it will not explain the periodicity of the attack: emphysema is constant, asthma paroxysmal. On the other hand, asthma is clearly an efficient cause of emphysema: the asthmatic condition is just such as to produce those physical changes that

constitute emphysema; and I think that all patients who have emphysema have had either asthma or bronchitis. It is confirmatory of this view, that emphysema comes on gradually, and that it bears proportion to the length of duration and severity of the asthma: if a person has had few attacks of asthma he has no emphysema, if he has had many, he has; the asthma precedes, the emphysema follows.

This then is the conclusion I come to,—that asthma is primarily humoral; that it is caused by a poison or morbid matter acting on that portion of the nervous system which ministers to the function of respiration; that it leads to dilatation of the lungs and the walls of the chest, to emphysema, and ultimately to dilatation of the heart; that the habit may pass off, the morbid matter being no longer created, the patient ceasing to be asthmatic, just as a person ceases to be gouty or epileptic; and that, ceasing to be asthmatic the patient may remain, or may not remain emphysematous, according to the severity and duration of his previous attacks.—*Med. Gazette. December* 13, 1850, *p*, 999.

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## 49.—DIPHTHERITIS.

[Mr. J. D. Brown, in a letter to the Editor of the "Medical Times," speaking of an epidemic of this disease which broke out in the autumn and winter of last year in Haverfordwest, out of two hundred cases of which forty proved fatal, remarks upon the insidious nature of the symptoms and the frequently fearful rapidity of its termination. He has repeatedly seen children, apparently in good health, suddenly seized with croupy breathing and laborious respiration, denoting its attack upon the larynx, and die within four hours from such sudden invasions. In many cases these alarming symptoms would seem to be relieved entirely, and the favourable state might continue for a few hours, and then another similar attack terminate the case at once. In other cases the changes proved slow, hesitating, and doubtful for hours and days. Mr. Brown proceeds to speak of the]

*Treatment.—General and Local.*—Local treatment is the sheet-anchor. The only one I found of use was a strong solution of nitrate of silver, never less than ℥i to ℥i, sometimes ℥ij., applied liberally three times a day, or oftener in very severe cases, to the tonsils and affected parts, with a piece of sponge fastened to a quill. I tried the pure caustic, but it enabled me to touch a few parts only of the affected tissues at a time, and those often too severely; I used, in their turn, several local stimulants but found none to answer so well as the solution of nitrate of silver.

Blisters and leeches were useless, often worse than useless; they exhausted and hastened death in every case. I found ext. belladonnæ and ung. hydrarg. fort., in equal proportions, of apparent use in relaxing the spasm of the laryngeal muscles, when laid thickly on the windpipe. It was only a palliative—never saved life.

*General Treatment.*—I depended on calomel, in combination with ipecacuanha, in doses varying from half a gr. each, every four or eight hours. In simple, uncomplicated attacks, I never lost a single case, nor ever allowed it to gain ground. If called before the windpipe was attacked, I never hesitated to say that a cure was certain, such confidence had I in my remedies, provided the system did not suffer from a primary attack on the stomach. I know of no disease of such magnitude more manageable.

I never lost a case, however severe, where I had established ptyalism. In three severe cases—a man of forty, a boy of twelve, and a girl of twelve—the croupy symptoms gave way, the false membranes, instead of maintaining their dangerous, blankety, continuous appearance, became patchy, and dissolved away like melting snow. The moment ptyalism was established, and not till then, I gave wine, and decoct. senegæ, and ammonia, and iodide of potassium at the same time. Emetics I found of great use in the first stages; they always relieved the distress in breathing, and carried away large quantities of mucus; in the last stages they only exhausted, and often would not act at all. The inhalation of vinegar vapour, and the vapour of hyd. c. cretâ, I have thought

useful in desperate cases. They seemed to prolong life in all cases, but never saved it.

I would in every case most unhesitatingly trust to the topical application of nitrate of silver in solution, and the internal administration of mercury, paying due attention to the powers of the system, supporting it with wine, quinine, and ammonia when required, taking great care not to debilitate nor exhaust by bleeding, warm baths, &c., &c.

I can venture to assert that the above treatment, if commenced at any period of the disease before the larynx becomes implicated, will succeed. The only cases I lost were those where the larynx and pharynx were simultaneously affected, the disease having commenced primarily in the stomach two or three days before, as evinced by vomiting, rigor, and general indisposition, and those where the laryngeal implication had shown itself before aid was sought. I had the benefit of a *post mortem* examination in two cases: the pharynx, tonsils, larynx, trachea, and bronchial tubes were more or less coated with false membrane, the larynx and trachea were thickly coated, the stomach showed symptoms of great irritation also.—*Med. Times, December* 28, 1850, *p.* 670.

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## 50.—SOME CHEMICAL PHENOMENA OF RESPIRATION.

By Mr. Horn.

Mr. Horn gives the following results of his examination of the gases expired from the lungs under different circumstances:—1. The longer the air is retained in the lungs the greater the proportion of carbonic acid it contains. Thus:—

| | Carbonic acid. | Oxygen. | Nitrogen. |
|---|---|---|---|
| Under ordinary circumstances . . . . . | 3 8 | 16.3 | 79.19 |
| The breath held during ten seconds . . . | 5.4 | 14.5 | 81.1 |
| " " sixteen seconds . . | 7.2 | 12.4 | 80.4 |

When the gases are expired under pressure—*e. g.*, through mercury—the proportion of carbonic acid is still larger. The following average variations have been observed by the author at different periods of the day:—

| | Carbonic acid. | Oxygen. | Nitrogen. |
|---|---|---|---|
| Morning . . . . . | 3.4 | 16.70 | 79,85 |
| Afternoon . . . . . | 4.6 | 18.68 | 93.34 |
| Evening . . . . . | 3.6 | 16.42 | 79.92 |
| After midnight . . . | 2.2 | 14.74 | 66-42 |

2. The expiration of carbonic acid is at its minimum at nine o'clock in the evening, and between three and four in the morning; the maximum points of the expiration of carbonic acid are from one to two o'clock in the afternoon, from six to eight in the evening, corresponding with the most frequent periods of exacerbation of disease.

3. The expiration of carbonic acid is augmented after taking food.

4. Infants and growing children expire more carbonic acid than aged persons; men more than women; and individuals of a sanguine and bilious more than those of a lymphatic temperament.

5. Moderate exercise, and the temperate use of spirituous beverages, increase the quantity of carbonic acid expired.

6. Drunkenness and narcotism produce the reverse effect.

7. Pain, sedentary occupations, menstruation, inflammation of the lungs, and fevers, induce a diminution of the quantity of carbonic acid expired.

8. Acute exanthemata augment the proportion.

9. Diarrhœa causes a decrease in the expiration of carbonic acid.—*Gazette Medicale*, 1850.—*Med. Gazette, February* 14, 1851, *p.* 285.

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## 51.—THE PULMOMETER.

By Samuel Hare, Esq.

[The following is a description of this ingenious instrument, which, as its name implies, a "a measurer of the capacity of the lungs."

"It consists of a glass vessel, open at the bottom, and

part with a stopper, which can be inserted or removed at pleasure. This vessel is graduated from above downwards into cubic inches, from one to 350, and is accurately suspended in a circular tin vessel, being, at the same time, counterbalanced by means of weights attached to it with cords, which pass over pulleys in the transverse bar at the top of the apparatus. These weights move upwards and downwards according as the glass vessel is depressed or elevated. If a person breathe through the mouth-piece the air will enter the glass vessel, and raise it in proportion to the quantity expired. The stopcock should then be at once closed, and the glass vessel being a little raised until the level of the water within it is the same as that without, the number of cubic inches of air contained in the vessel can at once be read off.

"The instrument attached to the pulmometer is for the purpose of ascertaining the *force* of the inspiratory and expiratory actions."

This instrument, in its object and construction, bears a considerable resemblance to the *spirometer* of Dr. Hutchinson: which is well known to many members of the profession: but we are informed that it had been invented and in use several months before Dr. Hutchinson's apparatus was made public in 1844: and also that no communication had taken place between the relative inventors of the pulmometer and spirometer, in which case each instrument may be considered the result of an original idea in the mind of its proposer. Mr. Hare has found the pulmometer to be of considerable use in determining the rate of improvement in the health of his patients, whether labouring under disease of the lungs or spinal diseases, which latter naturally affect the capacity of the chest, and to the treatment of which diseases Mr. Hare has mainly directed his attention.—*Lancet*, *April* 5, 1851, *p.* 383.

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## DISEASES OF THE ORGANS OF DIGESTION.

### 52.—ON THE TREATMENT OF OBSTRUCTION OF THE BOWELS.

By Dr. Edward Wells, Oxon., F.R C.P.

[Let us suppose an instance of this kind. We are called to a patient who has had no proper evacuation from the bowels for the last seven or eight days, though he has taken repeated doses of powerful aperient medicines, none of which have operated effectually. On examination you find some degree of distension about the umbilicus, with a varying degree of tenderness on pressure. In severe cases you may find permanent sickness, mucus or bile being rejected from the stomach. The tenderness on pressure is not so great as we might expect. Flatus is felt to rumble in the intestines, and proceeds as it were downwards to a certain point, and then stops. With all this the tongue is moist and often clean: the pulse is not perhaps accelerated, generally weak: the urine, provided the obstruction is not high up in the bowels, is not necessarily affected, though generally high coloured.]

Under these circumstances, and especially in the milder cases, the first thing perhaps that you do is to order a large enema to be thrown up. It is found to traverse the large intestine easily: the patient assures you that he feels it go as far as the ilio cœcal valve, and after a short time it returns without any tinge of fæcal matter. The obstruction is not in any part of the colon, but somewhere in the small intestine.

What treatment should, then, be adopted? In the severer cases, where there is pain upon pressure, distension of a portion of the intestine, a rumbling of flatus, and frequent vomiting, it will be said that the line of treatment is easily chalked out; that, whatever the cause of the obstruction, we have inflammation superadded; and that our treatment must be directed to subdue the latter. This is quite true, and in such well-marked cases I do not think there would be much chance of the case being misunderstood. But we must

nstances of the disease are only the consequence
f the symptoms of its milder forms. We
ase of obstruction is liable to run on into
ng an action of the bowels, we are in-
g medicines. Finding that the pa-

tient's chief discomfort arises from the fact of the bowels not acting, that he professes himself as feeling otherwise well, we are, perhaps rather too liable to fall in with his fancies, and just give him one more dose.

Now, in these cases what ought we to do? In the first place, abstain entirely from all purgative medicine. It will be much better to err in not giving sufficient aperients, than to err in giving too much. The first thing to do is to compose the patient's mind by informing him that there is no hurry for the bowels to act; that if he waits patiently, they will be sure to act in time; to tell him instances of persons who have gone a long time without any action of the bowels, and have done well.

Next, in these cases of obstinate obstruction I have great faith in the lancet, where it can with safety be used. It has seemed that a slight degree of faintness produced by blood-letting has acted very beneficially in removing the exciting causes of the obstruction, probably by the general relaxation which the faintness itself occasions. By putting the patient in an upright position, and bleeding him until he begins to feel slightly faint, I think we are quite safe not to do him any harm. If he is of a weak, nervous temperament, a very few ounces will produce the desired effect. If he be strong, he will afford to lose more. Where, however, the debility of the patient forbids the use of the lancet, it will be as well to apply leeches around the umbilicus. These act, probably, by relieving the local congestion, which is either the cause or the effect of the obstruction.

These measures premised, the safest plan is, I think, to put the patient upon repeated doses of calomel and opium. Even if inflammation be totally absent, the exhibition of these two drugs is likely to be attended with the best effects. The opium soothes the bowels already irritated by the repeated cathartics: it allays the over excited peristaltic action: it relaxes any contingent spasm, and quiets the patient's mind. To effect these objects it must be administered in sufficient doses—such as gr. ¼ to gr. j. every four hours. The calomel, by improving the secretions, and exciting the action of the liver, tends to remove the cause of the obstruction. And if this happen to depend upon a partial enteritis, the combined action of these two medicines would hold out the best hopes of a successful treatment. If the calomel be sufficiently guarded by opium, there is not, I think, any fear of its producing any serious irritation of the bowels.

While using these remedies I should be in no hurry to accelerate the action of the bowels by aperients. I should rather wait until they begin to act of themselves, as they generally will; and then, provided no inflammatory symptoms were present, there would be no objection to administer a dose of castor-oil to aid their propulsive efforts. In these cases it is also better to delay the administration of aperient enemata until the bowels are acting of themselves. Previously to this they appear to add rather to the patient's discomfort, probably by the distension they occasion in the large intestine, which reacts upon the parts already distended by the obstruction.

When there is no tendency to sickness it is better to allow the patient to take food in the shape of gruel, by the mouth. It prevents that sense of sinking which he often experiences, and it probably acts in some degree mechanically in propelling the contents of the intestinal tube.

In those severer cases, where there is frequent sickness, with pain in the bowels, and a rumbling of flatus, the above measures will be still further indicated. But there will also be other things which it will then be necessary to attend to. In these cases it is of great importance to abstain from giving any food by the mouth for some days. A teaspoonful of cold water should be put into the mouth from time to time to allay the patient's thirst. His support should be entirely entrusted to beef-tea injections. It is proved that these are sufficient to maintain the strength for some time—at any rate for a period sufficient to allay the irritating symptoms, which forbid the exhibition of food by the mouth. This part of the treatment I am inclined to consider as of the highest importance: for as long as food is continued to be administered by the mouth, and is rejected by vomiting, there will be little chance of arresting the inversion of the peristaltic action of the intestinal tube. The nutritive ene-

matta should be of small bulk, not exceeding at the outside a quarter of a pint; otherwise they will not only be retained, but they will add to the patient's sufferings. They should be administered at regular intervals of four hours. When there is much rumbling of the intestines, or when there is a difficulty as to the retention of the injections, it is advisable to add to them a certain proportion of laudanum.

I have confined my remarks on this occasion to the *treatment* of these cases of obstruction: I have said nothing of their *pathology*. I shall probably be told that the severer cases which I have described are nothing but cases of enteritis; and this is probably true to a certain extent. But what I have been most anxious to discuss is the treatment of the milder cases. Whether they also are not most frequently cases of partial and slight enteritis I will not take upon myself to say, but I feel convinced that the safest way of treating them is to suppose that they are such and treat them accordingly. It may be said that some of these cases arise from intussusceptio or internal herniæ. There is no doubt that this is sometimes the case, though, I suspect, less frequently than is generally supposed; but, if it were so, the treatment I have recommended would answer better than any other to this state of things also.—*Med. Gazette, Nov.* 22, 1850, *p.* 872.

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## 58.—ABSORPTION OF ALIMENTARY SUBSTANCES, AND FUNCTIONS OF THE LACTEALS.

M. Bernard read a memoir of this subject, before the Academy of Sciences, at Paris, in which he proposed to determine, by direct experiment, the nature of the nutritive principles which are absorbed and conveyed by the chyliferous vessels, in order to ascertain if there really exist any alimentary substances which absolutely escape venous absorption, and consequently avoid passing through the liver before arriving at the lungs.

Alimentary substances submitted to digestion are, in the intestinal canal, finally reduced to three principal substances—the saccharine, the albuminous, and the fatty emulsive; on these M. Bernard has instituted experiments:—

1. *With regard to the absorption of Sugar by the lacteals.*—On injecting large quantities of sugar into the stomachs of different mammiferæ it has been found in the blood of the portal vein, while it was absent from the chyle of the thoracic duct at the same time and under the same circumstances; whence it is concluded that sugar, before arriving at the lungs, traverses the liver, where it undergoes a peculiar physiological modification. If a solution of grape sugar be injected into the superficial veins of a dog, it speedily passes off by the urine; on the contrary, if the solution of sugar be injected into the radicles of the portal vein, the sugar is no longer eliminated by the kidneys, but passes into the circulation, and is assimilated in the same manner as if taken into the digestive canal. Thus it is shown that the absorption of sugar by the portal system is a condition essential to its assimilation, since, if confined to the lacteals, the saccharine principle is abstracted from the influence of the liver, and is diverted directly into the general venous circulation, as takes place when it is injected by the jugular vein.

2d. *As to the absorption of Albumen by the lacteals.*—Albumen injected into the general venous circulation soon appeared in the urine. If injected into the portal vein it does not then appear in the urine, but is assimilated in the same manner as obtains with sugar.

3d. *Absorption of Fat.*—M. Bernard's previous researches have shown that fatty matters are not capable of admission into the lacteals, until an emulsion has been formed by the action of the pancreatic juice. Immediately that this emulsion has penetrated the lacteals, their aspect undergoes an entire change: instead of remaining transparent, like other lymphatics of other parts of the body, they assume a milk-white appearance, and owing to the transparency of the coats of these vessels, the course of the fatty matter may be followed from the intestine to the left subclavian vein, where it is diverted into the thoracic duct. It is not necessary that fatty matters should traverse the liver in order

to their assimilation. M. Bernard has injected fatty emulsions into the jugular vein, but has not found that substance in the urine.

Thus the products of digestion may be distinguished, with reference to absorption, into two groups,—*e. g.*, 1st, fatty and albuminous matter absorbed by the lacteals, passing into the general circulation without having traversed the liver. The last proposition cannot be taken in so absolute a sense as the former, since experiment and microscopical examination demonstrate that fatty matters are absorbed both by the portal system and by the lacteals.—*Med. Gazette, January* 10, 1851, *p.* 79.

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## 54.—SUCCESSFUL EMPLOYMENT OF KOUSSO IN TŒNIA SOLIUM.

By WILLIAM WILLS, Esq., Totnes.

The following is another successful case of the use of this drug in tænia solium:

Mr. N. S., a young farmer, living at Ipplepen, had been for seven years afflicted with the most annoying consequences, arising from this parasite. He had tried every variety of remedy, as well as every person he could think of, both regular and quack, during this period. I procured for him a dose of the kousso, and administered it on the 4th instant, according to the instructions given by M. Boggio. Four hours after and about ten minutes subsequent to taking a seidlitz, to assist its operation, he expelled the animal, quite dead, and entire, he having suffered scarcely any inconvenience from the medicine.—*Lancet, December* 14, 1850, *p.* 651.

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## 55.—PREPARATIONS OF MALE FERN, AS REMEDIES FOR TAPE-WORM.

M. MARTIN-SOLON, in a paper on the various remedies for tape-worm, in the 'Bulletin Général de Thérapeutique,' observes that, if the high price and scarcity of kousso sometimes render recourse to the male fern necessary, the powder of the rapidly dried fresh root should be used. Forty or fifty grammes (℥x to ℥xiii) should be given during the morning, in divided doses, and a purgative of castor-oil should be administered directly after. The oil of male fern, if well prepared, and mixed in quantities of two grammes, with enough powder of fern or mucilage, to make ten boluses, which are taken in the morning, at intervals of an hour between each, is usually efficacious; it kills the tænia, and often expels it immediately. The same effects result from the extract prepared from the tincture of the buds of the same plants, which is much used at Geneva, and which M. Debout says that he has used with success. He prescribes six grammes, to be taken in three doses, enveloped in unfermented bread, and given at intervals of an hour. It is sometimes necessary to follow the administration of these preparations by a dose of castor-oil in the afternoon. In this respect, kousso has an advantage over the preparations of male fern.—*London Journal of Medicine, December*, 1850, *p.* 1182.

[Owing to the great expense of that valuable drug, kousso, it cannot help but be gratifying to observe Dr. Budd's anxiety to give this cheaper remedy a fair trial. Among the cases in which he has given the oil of the Male Fern are the following:]

James M., aged forty-two, was admitted into Rose ward, September 10, 1850, having, with the exception of a little breakfast on the 9th, fasted since the morning of the 8th (two days). He also took a dose of castor-oil on the 9th, which opened the bowels freely. The patient first perceived joints of tape-worm with his motions two years ago last July; since that time he has passed them almost constantly, and twelve months ago he got rid of a large portion, twenty-four yards in length, by means of a dose of turpentine and castor oil; and from that time he has passed joints almost every day.

The patient was born at Stratford, in Essex; afterwards lived some time at Waltham Cross, in Hertford, but latterly in Red Lion Square, Holborn, from which place the worm has in all probability originated. The water is supplied by the New River Company.

The symptoms which he attributes to the presence of the entozoon are as follows:—Extreme and constant hunger; for the last year he has scarcely passed one night without being obliged to get up and eat something in the course of the night; a feeling of sickness in the morning, with a bad taste in the mouth, and a diminution of hunger at that part of the day. The bowels have frequently been very relaxed, and the patient has been much subject to headache. He has felt so drowsy in the day-time, that often he could have laid down and slept, even as he was walking in the street, and at times he has suffered from violent pain in the sides. The water has been high-coloured, and has deposited a lateritious sediment. The patient is of temperate habits, not having drank anything but water or tea for the last four years. He took the ethereal solution of the oil of the male fern at eleven o'clock A.M., the dose being one drachm and a half, mixed with eight ounces of water, and a little tragacanth mucilage to suspend it. This was taken all at one dose, and was followed by an ounce of castor oil at one o'clock The worm was passed at four; it proved of great length and the head was with it, attached to about three inches of the smaller segments. These fitted on to the rest of the worm, but were torn off from it. He went out the same evening to come back the first week in October.

We shall now adduce another case taken from among Dr. Todd's patients.

*Expulsion of the Tape-Worm by the Male Fern.*—(Under the care of Dr. TODD.)—E. C., aged 23, a servant, lives in Hatton-Garden, and has resided in London all her life. She never enjoyed good health, and for some time past has menstruated once a fortnight, sometimes more frequently, the discharge being always profuse and accompanied with intense pain. When about five years of age she was relieved of a tape-worm by medicine, but has passed joints up to the present time, and suffered much from giddiness, palpitation, indigestion, and a gnawing pain in the region of the stomach, generally unaffected but often relieved by eating. A fortnight ago her present illness commenced by fits of shivering, great lassitude, weakness and pain in the extremities, loss of appetite and nausea. The patient was admitted into Lonsdale ward, very weak, and unable to sit up throughout the day. The shivering still continued; she complained of universal pain, more intense, however, over the hypochondriac and epigastric regions, where there was great tenderness on pressure. She still has the gnawing pain over the cardiac end of the stomach, and is much troubled with flatulence. The tongue is clean, but there is an unpleasant taste in the mouth.

The patient was given two ounces of castor oil immediately, and put upon low diet. On the third day after admission she took, early in the morning, and after having fasted on the preceding day, one drachm and a half of the ethereal solution of the male fern in one ounce of mucilage and eight ounces of water. A little time afterwards, two ounces of castor oil were administered to the patient. The medicine slightly purged her; no part of the worm was passed; but two days afterwards a round worm (*Ascaris lumbricoides*) was noticed. A second dose of the ethereal solution was then given, and the tænia solium was ejected: the head was, however, not expelled with the great length of the entozoon which was rejected. Dr. Todd prescribed, first, quinine, and subsequently chloric acid for the patient; she became much better in a few days, and was discharged. It is to be sincerely hoped that further trials will contribute in fully re-establishing the reputation of the male fern as a vermifuge in tænia solium.—*Lancet, December* 21, 1850, *p.* 676.

[The following case by Mr. Pollard, of Halifax, corroborates the practice of Dr. Budd as to the value of the male fern:]

My patient has been the subject of tape worm for twenty-six years, and has taken everything that had been recommended to him, for its destruction, without any effect, (even turpentine, in doses of a teacupful.) Portions of the worm came from him when he was in bed, sitting, and walking. At last he began to lose his strength, his appetite failed him, he could not sleep, had constant pain in his head, with dimness of sight; pain in his bowels, which were very irregular, and altogether felt unequal to his exertions. I gave him the oil as directed by Hooper, and in about six hours afterwards he began parting with

portions of the worm, in all about twenty feet. He is now rapidly recovering his health and strength.—*Lancet, December* 7, 1850, *p.* 628.

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## 56.—SCHMIDT'S REMEDY FOR TAPE-WORM.

By the process of Schmidt, the tape-worm is said to be expelled in from three to five days, without injury to the patient. A trial of it was made, under the authority of government, in the Berlin hospital, when the results were found to be so favourable, that the King of Prussia purchased the secret through a pension of several hundred dollars bestowed upon the originator. The plan substantiates the the purely empirical fact, that vermifuge medicines, when exhibited separately, are less efficacious than when combined in complex formulæ. The patient commences by taking, in the morning, the following mixture:—℞. Pulv. rad. valer. min., ʒvi.; fol, senn. ʒij.; aq. ferv., ʒvi.; infunde et cola. adde sal. glauber, crystall., ʒiij.; syr. mannæ, ℥ij.; elaeosacch. tanaceti. ʒij., M.S. Two table-spoonfuls every two hours, drinking freely at intervals of sweetened coffee. With this he perseveres till seven in the evening. At noon he takes a thin gruel; and in the afternoon one or two herrings with the milt. At eight in the evening the patient has a herring sallad, with minced raw ham, and oil, sweetened with sugar, plentifully added. Frequently portions of the tape-worm begin now to be discharged. At six in the ensuing morning, he commences the following pills every hour:—℞. Assafœtidæ, extr. graminis aa, ʒiij.; gambog., pulv. rhei, jalap. aa, ʒij.; pulv. ipecac., digit. purp., sulph. antim. aurat. aa, ℈ss.; sub. muriat. hydr., ℈ij.; ol. tanacet., æther. anisi, aa, gt. xv. M. Divide into pills of two grains each, which are to be placed in a well-stoppered bottle; of these, six pills are to be administered every hour, with a teaspoonful of common syrup. Half an hour after the first dose, a tablespoonful of castor-oil is also given. Sweetened coffee is again to be taken freely at intervals during the day. At two in the afternoon, the worm is usually wholly expelled, when the pills are to be discontinued. Should only separate portions be voided, however, the remedies are persisted with, and a second dose of castor-oil becomes requisite. Meat soup is allowed at dinner, and in the evening. On the succeeding day, as an additional precaution, six pills are again exhibited at three different times—morning, noon, and evening. Such is the entire and complicated process, the alleged excellent effects of which are held to proceed more from the peculiar combination of well-known remedies, than from the employment of any new agent. Most adds, that this method of cure has been a hundred times successfully tested; and that it presents a warning, especially to young physicians, not to condemn too hastily the complex prescriptions of older practitioners, however much they may appear to offend against scholastic rules, or even the laws of affinity, inasmuch as there is often produced a *tertium quid* of real efficacy, which could not have been developed or found in more simple compositions. We leave it to British practitioners to judge, whether this commendation ought to be sufficient to induce them to give a trial to the singular process—ham and herrings included.—*Monthly Journal of Med. Science, March*, 1851, *p.* 303.

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## 57.—BENEFICIAL EFFECTS OF CREOSOTE IN THE TREATMENT OF DIARRHŒA.

By W. B. Kesteven, E-q, Upper Halloway.

[Mr. Spinks, of Warrington, first mentioned this drug as a remedy in Diarrhœa, in 1849. Mr. Kesteven states that he now very rarely employs any other remedy in that disease. He says,]

In most cases this alone has been given, and chalk mixtures, &c., &c., &c., have been entirely discarded. The form in which it has been administered to adults has been as follows:—℞. Creosoti, ♏j. ad ♏v.; spir. ammon. arom. ♏xv. ad ʒj.; aquæ ℥j. ad ℥iss.; where pain has been severe, tinct. camp. co. has been added. Mr. Spinks prescribed chloric ether; but the writer having

had reason to think it produced headache, has omitted that article without detriment.

In no single case has creosote failed to be of signal benefit; in most cases one single dose has sufficed to arrest the course of the disease; in very few cases has it been requisite to administer more than the second dose. The remedy has been tried (to keep within the limits), it may be stated, in considerably more than a hundred instances, and its effects can therefore be confidently affirmed. It is not, of course, hereby asserted that equal success will always attend its use; the circumstances of local influences, epidemic constitution of the season, &c., may modify results in other hands. The present communication goes on further to affirm that the writer, like Mr. Spinks, has found creosote more efficient than any other drug in stopping pain, vomiting, and purging, as combined in diarrhœa. Of its utility in cholera the writer has had no experience.

Creosote is well known to have a powerful effect in coagulating albumen and other animal principles; and it is probable that its astringent operation may be due to the exertion of some such influence on the lining membrane, as well as the mucous secretion, of the alimentary canal.—*Med. Gazette, Feb.* 7, 1851, *p.* 235.

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## 58.—EFFECTS PRODUCED UPON THE STOMACH BY GRIEF.

By Dr. Graves.

[The following cases exemplify the effects of nervous agitation first upon the functions, and afterwards upon the textures, of certain organs.]

The first case was that of a young lady, residing in Camden-street, who was frightened at night by a sudden fire, which threatened to destroy the house in which she lived. During the moments of danger she got a pain in the stomach, which recurred frequently for several months, and finally was succeeded by symptoms of ulceration in that organ, from which, nevertheless, she unexpectedly recovered. Several years afterwards she died of another disease. The body was examined by Dr. Ireland and myself, when we discovered that a very large ulcer had existed in her stomach, which had afterwards healed, but which, in the first instance, was prevented from discharging the contents of the stomach into the abdominal cavity by adhesionwith one of the neighbouring viscera, caused by effused lymph.

The second case was that of a young and healthy lady, over whose shoulder a musket was suddenly discharged in frolic by an inebriated man. She fell down in fit of hysteria from the fright, became subject to violent palpitations of the heart, and died in the course of some years, labouring under the effects of general dropsy, produced by heart complaint. I examined her body, and found great enlargement of the heart, and various organic changes in the valves.

I have lately seen a case analogous to this, and which exemplifies, in a manner equally striking, the effects of the mind on the body. A grocer, of very healthy constitution and full habit, became suddenly involved in pecuniary difficulties, having, in consequence of railway speculations in 1847, lost a large sum of money, and not been able to meet his engagements. He experienced, from having been perfectly healthy, a total disappearance of appetite and a loss of sleep, which afflicted him for several weeks. His appetite he scarcely at all recovered; he became emaciated and at times feverish. But after a few months he began to feel transient pains in his stomach, together with a sensation as if something was turning or moving in it. These pains latterly became more frequent, and the progress of the disease uninterrupted, exhibiting in its course all the symptoms of organic disease of the stomach. It is now two years since it commenced, and large tumors are to be felt in the neighbourhood around the pyloric orifice of the organ. The tumours are hard and scirrhous; he is emaciated to the last degree, and his case is evidently hopeless.—*Dublin Quarterly Journal, Feb.*, 1851, *p.* 8.

### 59.—CHLOROFORM IN LEAD-COLIC.

[The following are the conclusions at which Dr. ARAN has arrived upon this subject:]

There can be no doubt as to the possibility of very soon curing lead-colic, by the internal and external use of chloroform. The advantages of this treatment are striking. Lead-colic is eminently a painful affection; chloroform removes the pain. The disease is probably dependent on intestinal spasm, which tends to produce the characteristic obstinate constipation; chloroform calms the spasms. It does not, indeed, cause the lead to be evacuated from the system; but, by the employment of sulphur and alkaline baths, the skin is freed from the metal; and the same effect is produced on the intestines by enemata. No inconvenience is likely to arise, when the evacuations are re-established slowly and with difficulty, from the use, for some days, of castor oil or some other mild purgative. Drastic purgatives frequently increase the colic, and even produce vomiting, when given before the pains are calmed and the evacuations established. Chloroform, applied principally externally, immediately calms the pains, and facilitates the use of purgatives, if it be found necessary to employ them.

The mode of external application, adopted by Dr. Aran, is to pour from one to two drachms of chloroform on a wet cloth, and keep it applied to the abdomen for a quarter or half-an-hour. He also gives it in mixture; and in enemata, preceded by a common injection. It is on the local application, however, that he seems to place most reliance. The enemata have sometimes appeared to increase the pain.—*London Jour. of Medicine, January*, 1851, *p.* 67.

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## DISEASES OF THE URINARY ORGANS.

### 60.—DIAGNOSTIC AND THERAPEUTIC REMARKS ON RENAL ELIMINATION.

By Dr. J. S. SUTHERLAND, Leamington.

The eliminating power of the kidney being strictly of a purifying nature, and consequently of essential value to the due performance of the other organs, is, perhaps the very first function impaired in disease, whether acute or chronic; and in virtue of this aptitude to take on diseased impression, it forms an index of disease, as certain as the mercurial column does of the atmosphere. A diagnostic scale may thus be formed. Thus inflammation and congestion of an active nature are accompanied by urates—uric acid, albumen. Passive congestions and neuroses are indicated by oxalates, phosphates, &c.; whilst cystive saccharine matter, purulent deposits, animalculos, and the various pigmentous secretions, lead to the supposition of special and deep seated, if not organic causes of mischief.

But it is not only necessary to detect these—the value of each must be specially estimated, both by itself, and also when met with in conjunction with another symptomatic product of the renal secretion. There may be a rapid change in function, indicating as rapid a change in the nature of the disease. Thus spasm may imitate an inflammation in almost every respect but that of the condition of the urine—the urine will be found pale and devoid of solids; but when the secretion either suddenly or gradually acquires density and acidity, let the practitioner be on his guard, for real inflammation is at hand—the nervous disorder has run into its antitype, inflammation.

The products of the kidney, both natural and morbid, are easily distinguished by chemical re-agents, and especially by the microscope; but to render this beautiful study subservient to the diagnosis of disease in remote organs, as well as in the renal glands themselves, it is of much importance to simplify; chemical processes require time, and a sufficiently powerful microscope is a bulky instrument. It is only, therefore, in the study they can be used advantageously, where nice manipulation can be had recourse to; and a frequent practice of it in the study leads to an analytical education of the eye, which will, in a great majority of cases, be sufficient to point out the necessity or otherwise of more minute analysis. The eye, with the assistance of a small pocket urinometer, can easily recognise.

First, colour indicating undue acidity, excess of urea, bile, pigments, &c.

Second, absence of colour, indicating deficient urea, deficient acidity, deficient consistency, &c., except in diabetes.

When the diagnostic value of colour is combined with that to be obtained from a knowledge of the specific gravity, we gain a further step: for instance, combine pale secretion with low specific gravity, the probability is that Bright's disease is indicated; combine pale secretion with high specific gravity, we have diabetes. Moreover, high specific gravity, combined with high colour, undoubtedly indicates animal power or inflammatory disease; but as high colour *may exist* with low specific gravity, and *vice versa*, although rare, it becomes necessary to use the urinometer constantly.

By generalizing, simplicity is aimed at. As an example of the difficulty of bedside analysis, suppose the practitioner is called to give an opinion, and finds diuresis a prominent feature. Moor's and Fronum's tests for sugar require solution of potass, sulphate of copper, test tubes, and a spirit lamp; these are difficult of application, even if present. The test by yeast, and that by polarized light, are quite impracticable; the microscopic test for spores requires heat of several hours' duration.

With a view to simplify this detection of sugar, and with the limited experience of four cases of diabetes occurring within the last four years, we have observed a very characteristic effect result from tincture of the muriate of iron employed as a re-agent on urine of a saccharine nature. To a test tube half filled with suspected urine add two drops of tincture, gently and carefully dropped, so as not to run down the side of the tube. If sugar in any quantity is present, an opalescent albuminous-looking troubling takes place to the depth of a quarter of an inch from the surface, which gradually becomes crimson.

The tincture of the muriate of iron produces no action on uric acid, urates, oxalates, phosphates, or albuminous urine; nor with that characterized by an excess of urea. Without asserting, upon such a limited number of experiments, that this test is infallible, or possessed of any delicacy in detecting minute proportions of saccharine ingredients, it seems well adapted for general use.

There is one point intimately associated with the physiology of depuration, which has not been sufficiently dwelt upon by writers on this subject, viz., the almost total inefficiency of diuretic medicines in exciting depuration, for aqueous filtration is not depuration. Depuration, or the elimination of effete tissues in the form of salts, is the office of the tubuli uriniferi. Aqueous filtration is the office of the Malpighian bodies: the latter are comparatively easily excited to action; the former are a little under the influence of drugs. Water, therefore, may easily be separated from the blood, leaving the poisonous effete matter more concentrated, and consequently more poisonous; diuretics are, therefore, directly injurious. This is self-evident, and points to the cause of failure in the treatment of calculous disorders, when chemical antagonism forms the principle of action, namely, the total incompatibility of dynamic or vital chemistry with the science of the crucible and alembic. Before calculous disorders can be successfully treated by chemical re-agents, these re-agents must be used in such required proportions as to correspond exactly with the two great processes of reproduction and waste, called primary and secondary assimilation. In order that these may thus correspond, the atomic proportions, which rule with despotic power every chemical action and its results, must be adhered to, to an atom. A fraction of a grain of an acid or an alkali, or a still more subtle aura of a gaseous fluid, is enough to alter totally a chemical substance. Chemically speaking, the difference between sugar and oxalic acid and starch is inappreciable to the senses, and almost as inappreciable by chemical analysis; yet the one is convertible into the other by the vital chemistry of digestion. Differing from each other only in an atom of chemical proportion, a very common-place disorder, or a very fatal disease, is elaborated.

With this proof of the delicacy of dynamic chemistry, is it not, at the least, of questionable propriety to give acids, and alkalies, and metals, in utter ignorance of the quantities required to produce a required chemical result? Nor must it be forgotten how various are the elements that enter into, or that forward or retard, a chemical action. Thus, disproportion of elements of food,

noxious ingredients therein, temperature, consistency, superabundance, deficiency, are all involved in the chemistry of assimilation; to these may be added the more subtle influences communicated by the senses, the stimuli to which, whether excessive or deficient, whether too intense or too prolonged, all bear a part in the process; receiving impressions derived from chemical, mechanical, electric, calorific, and psychological agencies, and further modified by anatomical confirmation, age, sex, and influence of the will.

This may, in a way, illustrate the protentiality of vital chemistry; but it fails to give any idea of its infinitesimal power. The alvolar glands of the cobra de capello secrete a fluid, which, to the great Leibig's analysis, betrays nothing beyond the chemical properties of gum-water; yet a drop of this gum-water, not more an entity to the eye than the tiniest dew-sphere on the petal of a rose, possesses wholly within itself a mysterious power, fearfully destructive to life. In what laboratory was that little globe formed? But the physician who expects to control the chemistry of digestion by acids, and alkalies, and metals, might just as well attempt to form such a sphere; they are both chemical actions of a vital nature, equally occult, mysterious, and unapproachable by human skill.

Another point in the diagnosis of disease, too little adverted to by practical men, is the elimination of urea: for the term depuration applies to all the solid ingredients of the renal secretion. An excess of urea is a rare disease, and may be considered a disease of colliquation. A deficiency of urea is a common disorder, and may be considered of importance according to its completeness and permanency. Deficiency is entirely characteristic of chronic disease, and being the substance into which the nitrogenous elements of food are converted, and afterwards eliminated, its retention most naturally occasions cause for alarm. In a large proportion of chronic diseases, urea is accumulated in the system, through impaired integrity of the eliminating organs, the kidneys, but there is much reason to suppose, that a compensating eliminatory process is set up in the skin and the lungs, and probably, also, in the bowels. That the skin throws off urea, may be proved by applying to the stomach a pad, wrung out of cold water and occasionally renewed; in a few days a strong odour of urea will be exhaled from the surface covered by the pad; but this will only occur if urea exists in the blood in any seriously abnormal quantity.

If the skin, the lungs, and the bowels did not take up the vicarious duty of the kidney, hysteria, which is by no means a disease of a fatal nature, would be immediately dangerous to human life, for in that disease urea is most imperfectly eliminated; and this feature of hysteria leads to a further consideration, namely, the individual part borne by retained urea in developing other pathological conditions indirectly connected with hysteria. The most interesting of these, occasionally a precursor, but more frequently a sequela of the disease, is undoubtedly anæmia, and its prototype chlorosis.

"Bright's disease" of the kidney has generally been supposed to be characterized by albumen, or fatty globules; but it is much more so by deficient urea, for in reality, it is only in the early or inflammatory stage of the complaint that albumen is eliminated. In regard to urea, colour, and specific gravity, the renal secretion of hysteria and Bright's disease are exceedingly similar, for neither albumen nor fatty globules are essential in the latter disease. How then are they to be distinguished in the female? Not by the examination of the secretion during its ordinary state, but by the examination of it when casual acute disease has temporarily excited the vitality of the eliminating organs; and which, if Bright's disease be present, will again present an albuminous condition of the urine.

The points of resemblance between the two diseases are threefold; viz., 1st. Deficient elimination of urea! 2d. Superabundance of urea in the blood; 3rd. A great tendency to diminish blood-making power.

Analogy of pathological condition in diseases usually considered distinct, may lead to deductions, if not of absolute practical value, at least, of some interest in a philosophical point of view; thus in both diseases above mentioned, the presence of urea in the blood is incompatible with the existence of the red

blood corpuscle—the latter is gradually annihilated. Urea and iron are obnoxious to each other, the blood disc is chemically changed by the urea, and the well known endosmotic property of the enveloping membrane affords every facility for a chemical action. But when the antagonism and chemical re-action on each other of red blood and urea are referred to, the one a result of primary the other of secondary assimilation, the vital chemistry which presides over the process must not be confounded with the science of the laboratory; nor must it be expected that the red blood corpuscle when brought in contact with healthy urine, must become blanched as it is in a blood vessel, the fluids of which are contaminated by urea.

Is there any direct evidence that such a complicated action as the digestion of aliment is under the control of chemical re-agents? and is there any principle upon which the accomplished physician prescribes them? He certainly endeavours to avoid ingredients which he knows would, in a chemical sense, neutralize each other or produce new compounds. But beyond this all principle of chemical therapeutics is wanting. If acids, and alkalies, and metals are prescribed in clumsy doses, the physician must calculate that only so much of the substance is to be assimilated as may be required for a chemical action, and that any superabundance must be eliminated by the various emunctories; but in order that this theory may be supported, he must forget that nothing of a soluble or digestible nature passes off from the system, except as eliminated from the blood itself. If the metal iron be taken as an example of chemical therapeutics, it will be found that every practitioner has his favourite preparation of it. He generally choses the latest invention; he has run up the carbonates, muriates, sulphates, citrates, and has at length arrived at the proto-ioduret, which sounds well in a prescription, and is distinctly chemical in its nature. It is therefore necessary to investigate the action on digestion which this substance may be expected to exert. Can anybody say what part is enacted by the iron and what part by the iodine? Can he say whether a chemical action at all is formed within the body, or whether a compound of a most deleterious quality may not be formed, for we know that iodine is often retained in the system with much injury to it.

Again, it is no uncommon thing to prescribe acids upon the same principle, and even to combine them. Thus hydrochloric acid, for neutralizing various conditions of the urine, viz., alkaline, oxalic, and even lithic acids. But a higher degree of accomplishment in chemical therapeutics, lead the physician to prescribe the nitro-muriatic acid in such cases. Can he state the chemical action that takes place?

It must be evident to many, that chemical therapeutics have arrived at such a state of advancement as to savour of the mysterious if not of the visionary, and that the man who retraces his steps towards the ancient simplicity of Hippocrates may not be on the worst road of the two. Nor is evidence wanting that such a retrograde movement is in progress.—*The Institute, Jan.* 25, 1851, *p.* 57.

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## 61.—EXPLANATORY OBSERVATIONS

### ON THE MORE SPEEDY COLLECTION AND ADJUSTMENT OF URINARY SEDIMENTS—SPONTANEOUS AND ARTIFICIAL—FOR MICROSCOPICAL EXAMINATION, AND FOR THEIR MORE PROMPT AND IMMEDIATE DIAGNOSIS.

By Robert Venables. A.M., M.B., Oxon.

Owing to the length of time frequently required for urinary sediments to subside, it is impossible for many, whose time is fully occupied professionally, in all respects to treat their cases under the perfect knowledge of the real and exact nature of the urinary deposit, when very possibly such knowledge may be of essential importance in the treatment of the case. Dr. Venables kindly pays his tribute to the general professional convenience by submitting his own plan to the notice of his medical brethren. He says.]

When a specimen of urine is to be examined, it must present to us one or

other of the following conditions:—it either contains a deposit or it does not. If it present the latter condition, the circumstances require no special observations here. But if it contain a deposit, this must either have subsided, or it will be found generally diffused through the urine, rendering the fluid what has been called *turbid*. We shall first consider the deposit as having subsided. In this case, the supernatant urine should be carefully poured off, so as to leave the deposit undisturbed at the bottom of the bottle, which should now be corked up and inverted, so as to let the sediment come in contact with the cork; the bottle is then to be re-erected and the cork withdrawn. Innumerable particles of the deposit, whatever its kind, will be found adhering to its end, which is to be applied, and gently pressed upon the flat or plane surface of one of the glass slides or supports. An abundance of the deposit will adhere, and should be covered with a slip of thin or French glass. The object is now ready for microscopic examination.

If the sediment be generally diffused by shaking during the carriage, or otherwise, by merely inverting the bottle for a few seconds, re-erecting, and then applying the cork as already explained, enough of any urinary sediment may be collected and transferred to the slide, and thus be prepared, in a few seconds, for microscopical examination. I have by this means repeatedly discovered and exhibited intermixtures of oxalate of lime and uric acid, oxalate of lime and urate of ammonia, and of the latter with crystals of uric acid, during the short space of an ordinary consulting visit; and this when the oxalate, in consequence of various intermixtures, had escaped the detection of considerable expertness and address in urinary examinations. By this process I can detect the nature and composition of almost any urinary sediment in less time than would suffice for taking the specific gravity by the urinometer. For instance: phosphate of lime with the double phosphate of magnesia and ammonia, forming the "fusible" or mixed phosphates, blood-discs in hæmaturia, the fat globules so frequently diffused through chylous and other varieties of morbid urine. In fact, whatever the nature or variety of intermixture, sufficient of each and every principle will be found attached to the cork, so as to enable us to recognise them.

That all the matters composing a deposit, and diffused through the urine, may be detected and recognised by an expert and practised explorator, admits of no question or dispute; but it is the facility and expedition with which the exploration may be made, that in my mind gives the process just described its value, and which have induced me to submit it for the benefit of those to whom time and promptness are objects of some consideration.

Although a little practice would enable any one—even the least conversant with urinary manipulations—to remedy or provide against some little difficulties occasionally experienced, still, perhaps, it will be as well to notice such as are sometimes met with, and the means which I myself adopt for overcoming them. The objection to the pipette for the transfer of a drop for microscopical examination is, that the drop almost always contains too much fluid, so that there is a considerable depth between the upper surface of the fluid and the surface of the glass support upon which it rests. This is often quite sufficient to float the slip of French glass, and on pressing it down, such strong currents are caused in all directions in the fluid, that any very minute light crystals, as octohedres of oxalate of lime, or indeed tolerably heavy crystals are carried away from under the slip of thin glass, and of course out of the sphere of vision. This is so powerful a cause of disappointment, that I have found crystals of oxalate of lime. intermixed with uric acid in urine, the former of which had escaped the observation, or rather detection, of very able and expert explorators; so much, that, upon a very recent occasion, a medical gentleman, whose patient called upon me, would not but believe that I had deceived myself; and it was not until he saw the process that he became convinced.

A difficulty of this sort can never occur with the cork, because it rarely, if ever happens, that more fluid adheres than is barely sufficient to produce distinctness of outline and clearness of vision in the object. It may happen, from unusual viscidity, that a greater quantity of fluid may adhere to the cork;

but this is easily remedied by gently and slowly inclining, and allowing the bleb or drop to collect at the most dependent part of the edge of the cork, and touch it with a tread, camel-hair pencil, or even the lip of the bottle. The crystals may then be transferred to the slide, and they will be found resting on the surface of the support; nor is there any danger of their being swept by any currents out of the area of observation, as there will not be fluid enough to float them, or currents strong enough to carry them away.

In certain cases, when the sediment has subsided and collected at the bottom of the vessel, it may be intermixed with various matters—products of decomposition, or the crystals and other minute objects may be so numerous and crowded together, that their forms and appearances will be obscured, possibly completely concealed, and so escape detection. This frequently occurs with the urates, phosphate of lime, but more remarkably with the oxalate of this earth. This inconvenience may be remedied by transferring a portion of the sediment to a test tube, adding a sufficiency of clear or distilled water, and shaking up the whole, so as to diffuse through the fluid in mechanical suspension. If the tube be then corked and inverted for a few seconds, on re-erecting, a sufficiency of the deposit will be found attached to the cork, and may be transferred to the slide in the manner already explained. If the sediments so collected be now examined in the microscope, they will be seen perfectly clear, distinct, and sufficiently apart, to exhibit their forms, outlines, optical and other distinguishing properties. We shall thus be enabled to recognise the crystalline appearances of the uric acid,—double phosphate, commonly called "triple," and oxalate of lime; and also the amorphous characters of those uncrystallised compounds—phosphate of lime, the urates of ammonia, and of the other alkalies and earths. These and the various intermixtures which occur in urine in which they have remained long, and being rendered indistinct by the changes which spontaneously occur under such circumstances are rendered perfectly evident by this mode. This expedition and saving of time must prove a great advantage in the examination of urine—such as it is constantly falling to my lot to make—sent up from the country from long distances, and probably kept till spontaneous decomposition has rendered microscopical examination by the ordinary methods, not only difficult, but extremely obscure.

I have also lately had one or two applications requesting information as to the easiest and quickest method of distinguishing phosphate of lime; the opaqueness and amorphous forms of which present no optical or microscopical characteristics sufficiently distinctive. In the 'Elements of Urinary Analysis,' various chemical and other methods are pointed out; but that which I am about to detail will be not only quick, but easy of performance.

Phosphate of lime may be readily confounded with mucus, or with pus, with which, in large quantity, it is often intermixed, and this greatly increases the difficulty. It was upon one occasion or two of this sort, in which I was obliged to correct the mistake of taking phosphate of lime for a purulent deposit, and upon another for urate of ammonia, that I determined to notice the subject in this place.

In many instances, I have found the phosphate of lime forming exclusively the whole of the deposit, with perhaps the exception of a mucous or pus globule or two; and this has occurred to me so frequently, that I have felt greatly at a loss to understand the assertion by Dr. Prout, of the extreme rarity of such a deposit as in idiopathic affection. I meet with it tolerably frequently, and, in a fair proportion of instances coming under my own observation, the characters and phenomena were as much idiopathic as those of any other of the diatheses.

But, however rare the pure phosphate of lime, the intermixture with the double or prismatic phosphate is by no means very uncommon. The prisms of the double phosphate are not difficult of detection; for their form and crystalline appearance cannot be easily mistaken; but the amorphous intermixture of phosphate of lime is not so easily recognised: nor is the difficulty at all diminished by the mucous or muco-purulent exudation with which such forms of deposit are usually intermixed.

To detect the phosphate of lime, a portion of the urine turbid with its sedi-

ments should be set aside; and when the deposit has subsided, the supernatant urine is to be poured off and a portion of the deposit transferred to a test-tube, and well washed by repeated washing with distilled water, till freed from all traces of adhering urine. A small portion of the washed sediment is to be next dissolved in a few drops of acetic acid diluted with distilled water. Whether the sediment consist wholly of the phosphate of lime, or of the mixed phosphates, a perfectly clear and colourless solution will be the result, unless there be mucus or pus, or both intermixed. In this case, or if there be opalescence, or any want of clearness or transparency, the solution should be run through the filter, through which it will pass rapidly, perfectly colourless and transparent. The acetic solution is next to be treated with a weak solution of oxalic acid, when it will in a very short time, if any salt of lime were present, assume a degree of turbidness proportionate to the quantity of lime present. After adding the solution of oxalic acid, the tube should be corked up and inverted, so as to allow the oxalate as it forms to subside and attach itself to the cork. After a few seconds, if the tube be erected and the cork withdrawn and applied to one of the glass supports, the microscope will show numerous octohedrons of oxalate of lime; thus proving that a salt of lime formed part of the deposits, and must have been the phosphate, as, had it been the carbonate, the solvent action of the acetic acid would have been attended with *effervescence*.

Oxalic acid I consider preferable as the precipitant to oxalate of ammonia, because, although not so very immediate as the oxalate of ammonia, the resulting octohedres are larger and more easily recognised. This process, too, has the advantage of precipitating the oxalate of lime pure and unmixed, and consequently free from any causes of obscurity or distortion of outline, or of the other properties of recognition.

The acetic acid, though it dissolves the prismatic phosphate and, under particular circumstances, the phosphate of lime, yet will neither dissolve nor hold in solution the oxalate, which therefore separates in the octohedral form, and perfectly secured from any mixture of other salts, all of which it will hold in solution. The double phosphate of magnesia and ammonia, if it exist in the solution and be required, may be precipitated by neutralising the excess of acid by means of potass or its carbonate. When time presses we need not wait for the filtration of the whole of the acetic solution, but allow the first few drops of the filtered fluid to pass into a narrow tube containing a diluted solution of oxalic acid. When, even no turbidity whatever can be perceived, if the tube be corked and inverted for a minue or two, the octohedres will be collected on the cork and may be transferred to the glass slide.

As previously stated, although the prismatic phosphate may have its appearance in some degree obscured, still never so much as to render its appearance and identification impossible or even questionable. If, then, we wish to decide the question merely as to phosphate of lime, we have only to add solution of hydrochlorate of ammonia, agitate the mixture, and precipitate the filtered fluid by solution of oxalic acid or oxalate of ammonia, octohedral crystals will be obtained equally as before. The phosphate in its hydrated or gelatinous state, as when recently precipitated, is soluble in hydrochlorate of ammonia, but the prismatic crystals are not; consequently the two salts may be thus separated.

I was first induced to submit these few explanatory observations to the Profession as rendering inquiries easy and expeditious, which many have represented to me as tedious and difficult. This I consider as of peculiar advantage in the discovery of the presence of oxalate of lime. I am, therefore, not a little surprised on perusing the following observations of Dr. Bence Jones. Speaking of the oxalate of lime, he observes:—

"It requires no skill, and no preparation of the urine, to find the oxalate of lime. Generally oxalate of lime octohedra are found without the least difficulty," &c.

I must confess that I cannot agree in this statement generally, or even as a general principle. In hospital establishments and public infirmaries, where the patients are under constant *surveillance*, and where all those difficulties and obstructions which occur in private practice can be met and obviated, the dis-

covery of oxalate of lime may prove tolerably easy in sufficiently practised hands, but from this, as a general proposition, I must dissent. In this view, too, I think I am supported by Dr. Golding Bird, who gives special directions for their collection and adjustment.

With respect to time, however, Dr. Bence Jones admits that such is required. "The urine," he says, "should be left to stand for twenty-four hours in a bottle or tall glass: the upper part of the fluid should be poured off, and the last few drops remaining in the glass or bottle should be examined."

By the plan proposed little or no time—beyond a second or two—is required, and we have the advantage of seeing the crystals distinct, as well as those principles which may co-exist with them in the urine, and these equally distinct and recognisable.

The authority above noticed also throws some doubt upon the nature or composition of the octohedral crystals. He says:—"Generally oxalate of lime octohedra are thus found without the least difficulty; sometimes in large crystals, very frequently in aggregations of small octohedra, forming microscopic calculi. Dr. Golding Bird was the first observer who stated that these crystals, which had for some time previously been observed in urine, were oxalate of lime. The chemical proof is difficult, if not impossible, to obtain, for the octohedral crystals are rarely present in sufficient quantity to admit of perfect examination."

I must say of these statements, that I myself in no way agree with them, neither do I think the question of such insurmountable difficulty; nor are the crystals always so scanty in quantity as to evade the chemical proof of their composition. The first proof I would offer is, that from a specimen of almost any urine, previously acidulated with a little acetic acid, oxalic acid will throw down *octohedral crystals*, presenting in every particular the microscopical appearances and characters of those occurring spontaneously in urine. Secondly, If the gelatinous phosphate of lime precipitated from the solution of chloride of calcium by phosphate of soda, be re-dissolved in diluted acetic acid, and the acetic solution treated with solution of oxalic acid, octohedres, precisely like those observed in the urine, will be thrown down. Octohedres, also, of precisely similar appearance, may be thrown down by oxalic acid from the solution of the same phosphate in hydrochlorate of ammonia; and still more speedily, by oxalate of ammonia as the precipitant.

With respect to the quantity for chemical proof I can only say, that I have at the present moment frequent occasion to examine the urine of three individuals, depositing the octohedral crystals in large quantity, intermixed with rhombs and prisms of uric acid; and, in a fourth case, with urate of ammonia. If the micturitions of twenty-four hours, of any one of these cases, be collected, the octohedres will be found in quantity sufficient for any chemical proof of composition; and I have determined qualitatively, the chemical composition of all. The following is the process adopted:—

The urine contained uric acid intermixed with the octohedres, and having remained at rest, was decanted, and the subsided sediment washed with distilled water, and then agitated with a dilute solution of potass, at the temperature of 98° Fahr. Being left at rest, a cloudy, mucous-looking sediment, rather bulky, occupied the lower part of the jar. The supernatant fluid being poured off, and the precipitate washed, was allowed to subside. Collected and dried, it was treated as follows:—

A portion heated in a platinum spoon over the spirit lamp, for a few seconds, dissolved with effervescence in dilute acetic acid. Another portion, ignited before the blowpipe, dissolved very sensibly in water reduced to the temperature of 31° Fahr.; the solution had a strong alkaline reaction. Both these solutions gave precipitates with oxalic acid, which, examined with the microscope, were found to consist of octohedral crystals, thus leaving no doubt of the base being lime.

To determine the nature of the acid, a small quantity of the collected crystals were dried, by being placed under a jar, over strong sulphuric acid. They were then distilled with concentrated sulphuric acid in a tube retort, and the products received in a graduated tube over mercury. A volume of gas was the

product, one half of which disappeared on agitation with solution of barytes, and the remaining volume burned with all the characteristics which distinguish the combustion of carbonic oxide. These facts, I think, put the question of the composition of these crystals beyond all possibility of doubt.

There is another remark of Dr. Bence Jones which I think it right to notice here. He says:—"Oxalate of lime is so insoluble in distilled water, that it might well be considered insoluble in the urine. Its occurrence in the form of crystals shows, that it cannot be insoluble, for crystalline form implies deposit from solution. Careful observation of the urine also shows that the oxalate of lime is soluble therein."

Previous solution is not necessary to crystalline form. Fused sulphur crystallises on cooling; arsenious acid sublimes in octohedral crystals. But the authority above noticed states a more important fact, namely, that a gentleman, aged fifty-nine, passed about a drachm of urine at half-past ten in the morning. It was examined immediately, but no oxalate of lime could be detected, although this principle was expected and looked for. On examining, at nine the following morning, a drop under the microscope, myriads of small crystals of oxalate of lime were seen.

For myself, I can only say, that I have never been able to detect oxalate of lime crystals in urine which had been filtered before being set aside. I have filtered urine immediately it was passed, and which was known to contain octohedral crystals; but no such ever appeared in the filtered portion; nor could I precipitate them by any re-agent, chloride of calcium or acetate of lime. I know of no urinary re-agent capable of holding oxalate of lime in solution; and it is impossible to conceive that oxalic acid may be generated in the urine after it has been emitted from the body. Dr. B. Jones, speaking upon the question, further observes; "I had for some time passed over similar observations, by supposing that my first examination had not been made with sufficient care; but, from the above, and other cases that have since occurred to me, I am certain that it sometimes requires many hours for the oxalate of lime to crystallize out. You cannot say that no oxalate of lime exists in any urine until at least twenty-four hours have elasped from the time of the passing of the water."

Oxalate of lime being insoluble in all the organic acids, the only way in which these statements can be reconciled is by supposing the co-existence of free hydrochloric or nitric acid; together with urea, and some principle capable of exciting decomposition of the latter, and its conversion into carbonate of ammonia. In this way the acid would ultimately become neutralized, and its solvent powers suspended, and of course the oxalate of lime would in such circumstances separate. I have decided this question by experiment. Oxalate of lime may be dissolved in the acid, and re-precipitated by an alkali added till neutralization has been effected.

With some slight modifications, the foregoing plan for the identification of urinary sediments will be found equally applicable to the examination of phosphatic calculi. It has been stated, that phosphate of lime is soluble in both acetic acid and solution of hydrochlorate of ammonia. But this is to be understood as applying to it only in its hydrated or gelatinous state. After ignition, or after being dried, it is insoluble in either menstruum. Under these circumstances, if the calculus consist wholly of phosphate of lime, a small portion may be ignited before the blow-pipe, to destroy the animal matter with which it is intermixed. The fragment should then be pulverized. But on the other hand, should it consist of the fusible or mixed phosphates, the fragment is to be pulverized without ignition and reduced to an impalpable powder. The powder is to be dissolved in diluted hydrochloric acid, adding acid if necessary to complete solution. The solution is to be filtered, by which the animal matter will be separated. If the ammonia be now added to the filtered solution, in quantity sufficient for neutralisation, the double phosphate will be precipitated, and may be recognised by its microscopic characters; but the phosphate of lime will be held in solution by the hydrochlorate of ammonia formed. If a solution of oxalic acid or of oxalate of ammonia be added to the phosphate of lime held in solution by the hydrochlorate of ammonia, and freed from the

prismatic crystals by filtration, octohedres of oxalate of lime will separate, and may be readily recognised under the microscope. Where very great haste is required, all the characteristic phenomena may be evolved and made manifest by treating a single drop of either solution upon the slide with a drop of the appropriate test or re-agent, and, after a few seconds, placing the object under the microscope.

It is hardly necessary to say that these methods are equally applicable, not only to the sediments spontaneously deposited, but also to those artificially precipitated from urine by re-agents. If, for instance, to a small portion of clear or transparent urine in a test-tube any re-agent be added—oxalic acid for instance, or sesqui-carbonate of ammonia—and the tube corked and inverted, after a few seconds a sufficient quantity of the precipitated matter will be found adhering to the cork, and may be transferred to a slide and examined under the microscope.

[Dr. Venables remarks, that we often meet with urine above the specific gravity of 1.025, or even 1.030; and he says, that if the quantity is normal it generally denotes excess of urea or presence of sugar. It is most important to decide if sugar is present. But the presence of sugar may be detected in urine of low specific gravity, even when no higher than 1.015, and the quantity voided be only between thirty and forty ounces by measure in the twenty-four hours.]

The most ready and speedy of the processes at present in practice for the detection of sugar are founded upon the following principles:—First, the capabilities of the carbon of sugar, under certain conditions, to reduce certain of the metallic oxides, as of copper, silver, &c. Grape sugar, as a diabetic urine, exerts these powers much more speedily than cane sugar. Liquor potassæ also, as pointed out by Mr. Moore, exerts certain agencies upon sugar, and which provide us with a tolerably ready means. Still it has been represented to me, that these processes are not always quite so manageable, at least in the hands of those not expert in the practice of such manipulations. To such, then, I would suggest the following, as practically perhaps more simple and manageable.

Diabetic urine, in consequence of the sugar it holds in solution, undergoes, under favourable circumstances, in a very short time the vinous or alcoholic fermentation. This, the fermenting process, is generally greatly expedited by the addition of a *ferment*—for instance, a little yeast. The fermentation is attended with the formation of certain *confervoid vegetations—torulæ*—which collect upon the surface in the form of a whitish-looking scum, appearing like fine flour sprinkled over it.

To develope these phenomena, a quantity of urine should be poured into a shallow basin or evaporating dish,—a common saucer, if there be nothing else at hand, will answer the purpose very well,—so as to present an extended surface. The temperature should be raised to 75° or 78° Fahr. A small quantity—a few grains—of German yeast is to be mixed in and well diffused by stirring with a glass rod or piece of wood. The whole is then to be set aside in a place the temperature of which should be about 78° Fahr.

Where this is inconvenient, the temperature may be kept up by floating the dish in another containing a large quantity of water heated from about 85° to 90° Fahr., and the whole set aside. In a very short time—sometimes only a few minutes—provided sugar be present, an intestine motion commences, bubbles of gas rise to the surface, and the fermentation has commenced. A whitish-looking scum soon appears, spreads, like a film, over the surface. If a little of this scum be removed by a camel-hair brush, or a feather, or by touching the surface with the end of a cork, a sufficiency may be transferred to one of the slides. Examined under the microscope it will be found to consist of a number of minute vesicles of a somewhat oval form. As the decomposition proceeds, these vesicles elongate, forming a sort of stem; from which others sprout laterally, and indeed in all directions. The first stage may be observed in about a quarter of an hour, often in a much less space of time; but in an hour or two the vegetative process is complete, and torulæ may be seen, in all stages of their growth, under the microscope. If the process be

conducted in a bottle, the intestine motion may be observed in a very few seconds; and, if the bottle be corked, the cork being removed from time to time, the escape of pent up gas, on removing the cork, will indicate the evolution of carbonic acid, and a portion of the scum taken from the surface will prove the development of torulæ.

It has been already stated, that the production of torulæ is attended with a process—vinous fermentation—accompanied with the generation and extrication of carbonic acid gas. This gas, or at least its cubic volume, is a sort of equivalent or index to the quantity of sugar pre-existing in the fermented liquor. To determine the amount of sugar, then, we must so conduct the fermentative process as to be able to measure the cubic volume of gas disengaged, as each cubic inch of gas is equivalent to, or indicates, one grain of sugar.

[It is well known that the alkaline earths powerfully attract carbonic acid, lime and barytic waters attract it from the atmosphere and become muddy or turbid, and as the carbonates of these earths are insoluble, they precipitate. These facts point out to us a certain method of estimating the amount of sugar present in the urine.]

I myself (continues Dr. Venables) have never found any difficulty in the detection of sugar by this process; and, if the object be merely to ascertain its presence, irrespective of quantity, the process is very simple. We have only to introduce the urine into any bottle, adapt to it a cork fitted with a conducting tube, and excite fermentation, conducting any gaseous product into barytic water, which will become turbid if sugar be present. Torulæ may be looked for in another portion set aside to ferment in an evaporating dish or saucer.

I have tried the delicacy of these processes in a great variety of ways. It is not always possible to obtain diabetic urine, but we can readily prepare it, or a substitute for it, by dissolving the grape sugar in ordinary urine; and I have found that I could not only detect, but determine the amount by weight, of half a grain of grape sugar in 1000 grains of urine within 003 parts of a grain; and even this error probably might have been avoided by a little more care and attention in conducting the different parts of the process. It is evident that the other modes of detecting may be made use of to confirm the correctness, indeed, of each other.

I never met with any instance in which the cork did not retain quite sufficient for examination, but, by attaching a piece of chamois leather, &c., to the end, the adherence may be more completely secured.—*Med. Times, January* 25, *p.* 86, *and February* 15, 1851, *p.* 173.

## 62—SOME VARIETIES OF RENAL DISEASE, WITH ESPECIAL REFERENCE TO DIAGNOSIS AND PROGNOSIS.

By Dr. George Johnson, Fellow of the Royal College of Physicians, and Assistant-Physician to King's College Hospital.

[The following cases will point out some of the circumstances requiring particular attention in cases of renal disease. In many of the most obvious circumstances all the forms of renal disease are alike; the differences, however, by careful examination may be readily and certainly appreciated.]

The microscopical examination of the urine is much facilitated by placing it in a conical glass which will contain about three or four ounces. The fluid should be allowed to stand for a few hours before examination. I usually put it in the glass at night, and examine it with the microscope on the following morning. This delay is not necessary if the sediment is abundant; but in many cases, when the sediment is small in quantity, it is quite essential that time should be allowed for its deposition to take place. A small quantity of the lower part of the liquid should then be removed with a pipette, and placed in a shallow cell for microscopical examination.

Case I. *Acute Desquamative Nephritis—Urine very scanty, and highly Albuminous, with Epithelial Casts—Epileptic Convulsions and Coma—Recovery.* I was called to see Ann Fers, æt. 54, as a dispensary patient, on the 6th Dec.

1849. I found her in a state of semi-stupor, and learned that she had been seized with a convulsive fit in the night. She had a wild, distracted look. The tongue was brown and dry. I subsequently learnt that, during the preceding six or seven months, she had lived very badly, in consequence of her husband being out of work. She had gradually become weak; and had restless nights, with frightful dreams, and spectral illusions. About a fortnight before I saw her, she had become much worse, with vomiting, intense headache, slight general dropsical swelling, pain in the back, and very scanty secretion of urine. She was ordered to have six leeches applied to the temples, and to take three grains of calomel every four hours.

In the course of the evening some urine was obtained. It had an abundant precipitate of lithic acid, and contained numerous *casts of tubes, with entire cells of renal epithelium;* when boiled it became almost solid with albumen.

[On the 7th there had been no return of the convulsions; ordered to be cupped in the lumbar region. On the 8th she was better, relieved by the cupping, consciousness having returned soon after the operation. The urine was more abundant and clearer, and gradually became more so. Jan. 3rd. 1850, the urine was still albuminous, sp. gr. 1010, pale, abundant, and containing a very few casts, entangling disintegrated particles of epithelium. She ultimately completely recovered.]

With reference to treatment, I have found, in other cases of acute desquamative inflammation of the kidney, that cupping in the lumbar region has afforded the same immediate relief to the cerebral symptoms which was so striking in this case. There is no remedy in which, under the same alarming circumstances, I have an equal degree of confidence; and I feel assured that the abstraction of a small quantity of blood by cupping, from the region of the kidneys, is much more efficacious in removing cerebral symptoms, than any treatment directly applied to the head. In all cases of acute renal disease, whether occurring as a consequence of scarlatina, or from any other cause, when the urine is very scanty, and the patient complains of severe head-ache and drowsiness, there is much reason to fear that these symptoms may be followed by convulsions and coma; and unless the earlier symptoms are checked by a rigidly low diet, free purging, and the use of diaphoretics, no time should be lost in applying cupping glasses with the scarificator over the kidneys. The congestion of the renal blood vessels is by this means lessened, the secretion is quickly increased, and the blood being thus purified, the cerebral symptoms are directly relieved. It must always be borne in mind, that an imperfect elimination of the urine will impoverish the blood more than the abstraction of a moderate quantity from the vessels, and that an attack of convulsions, if it did not end in fatal coma, may produce greater injury in the brain than all the powers of nature or of art can repair.

Case II.—[The second case is one of *Chronic Desquamative Nephritis.* The patient, Benjamin Hobday, a waiter, æt. 47, was attended in January, 1847. He was in the habit of drinking freely, and had several times had gout. Three months ago, he had slight appearances of dropsy, but these soon subsided.]

This present illness began six weeks before I saw him, with cough and mucous expectoration. There was large crepitation over both sides of the chest. He was losing flesh: he always appeared dull and heavy; and his tongue was dry and brown. He took an antimonial mixture without relief. The urine was scanty and high coloured; it contained a small quantity of albumen, and numerous *dark brown casts, apparently composed of disintegrated epithelium.* No blood corpuscles were observed. The specific gravity of the urine was not noted.

Jan. 25. He had several attacks of convulsion, in the intervals of which he lay muttering and insensible. On the following day he died.

*Post-mortem Examination.* The brain and its membranes appeared quite healthy. The lungs contained scattered crude tubercles, and were much engorged and carnified. The only organs decidedly diseased were the kidneys; and they presented the characteristic appearances of chronic desquamative nephritis. The cortical substance was wasted, and its surface irregular and granular. Some tubes contained an excess of cells, differing little in appear-

ance from the normal epithelium; while the greater number of tubes contained the same granular material, which, when washed out, had evidently formed the casts which were observed in the urine during the life of the patient. Other tubes, again, were pale and transparent, being composed only of basement membrane; the epithelial cells, which probably had first become disintegrated, having been washed away by the current of liquid passing through the tubes.

*Remarks.* The preceding case is an example of the form of renal disease, which is very commonly observed in gouty subjects. The blood is contaminated by certain morbid matters, as a consequence of the gouty diathesis: the kidneys make an effort to eliminate these materials: and in doing so, their secreting cells undergo a modification. They become opaque and granular, then completely disintegrated, and subsequently are washed away, leaving the tubes denuded. After the destruction of the secreting cells, the tubes waste, in consequence of the removal of the vital attractive influence of the cells upon the blood. The cortical substance thus becomes irregularly contracted and granular.

There is one point of view in which it will be instructive to compare the case of Hobday with that of Fers. It might have happened to me to have seen Hobday for the first time, as I did Fers, soon after the first attack of convulsions. The question arises,—were there any distinctive signs in the two cases, which would have suggested, in the one case, a much more hopeful prognosis than the other? This is clearly a question of great practical importance, and one, too, which happily admits of a decisive and satisfactory answer. In the case of Fers, the urine contained what I have called "epithelial casts," that is, fibrinous matter entangling *entire epithelial cells;* and these, with albumen, and, very commonly blood, in the urine, indicate a recent acute disease in the kidney. In such a case, there is much reason to expect recovery, if we can succeed in warding off the urgent symptoms induced by the poisoned condition of the blood, consequent on the impaired excretory function of the kidney. In the case of Hobday, the appearances were very different. The casts in the urine were composed of *granular particles of disintegrated epithelium.* My observation has taught me to associate this form of cast with a chronic disease in the kidney. Where these casts have been observed in the urine during life, the kidneys will be found after death more or less wasted, sometimes extremely so, and the tubes will be in the condition described in the case of Hobday, some being entirely denuded, and others filled either with disintegrated epithelium, or with cells differing more or less from the normal epithelium. This chronic form of disease may have advanced to the extreme stage of atrophy before the occurrence of any urgent symptoms. Amongst the most common and most serious of its ultimate consequences, is an attack of convulsions recurring more or less frequently. Now, if in a case in which convulsions have once occurred, we find the urine albuminous and containing the "granular casts" described above, we must be prepared for a recurrence of the attacks, and for the probability of a speedily fatal termination.

I must beg my readers to bear in mind, that the preceding remarks relate to cases in which convulsions or coma, or other serious mischief, have resulted from deficient renal excretion, such symptoms affording evidence of extensive disease in the kidney, which, if it have gradually advanced to that degree by a process of chronic inflammation, is but very little under the influence of treatment. The "granular casts," *per se*, indicate merely the *form* of disease, and not the stage of the progress, or the degree of mischief which it has produced. Still the existence of these casts is a very important sign, being present from the very commencement of the chronic desquamative process. They may often be detected before the disease is so far advanced as to render the urine albuminous; and at this early stage of the disease we have most reason to expect that our remedies will be successful. Further, the proportion of this granular material in a given quantity of urine, affords an index of the rate at which the disease is progressing. The granular casts are composed of disintegrated epithelial cells, which, being thus shed, appear in most instances not to be reproduced; the greater, therefore, the quantity of this material discharged with

the urine, the more rapid must be the destruction of the secreting tissue of the kidney, and the more speedy will be the occurrence of urgent symptoms from suppressed secretion. In the extreme stages of chronic desquamative disease, the granular casts sometimes disappear more or less completely, and are replaced by casts of a very different kind, as will be seen in the history of the succeeding case.

It may be well to remark in this place, that there are at least two circumstances, under which the occurrence of granular casts does not indicate the chronic disease above alluded to. A moderate amount of care will, however, in either case prevent an error of diagnosis. *First*, after an attack of acute desquamative nephritis, it commonly happens, that for some days, while the urine is returning to its normal condition, casts composed of disintegrated epithelium and blood are discharged with the secretion; these gradually diminish in number, and soon entirely disappear. *Secondly*, after an attack of renal hemorrhage, some blood, which has remained in the tubes, becomes disintegrated and washed out in the form of granular casts, which, however, have generally a yellowish-brown blood-colour, and this would suffice to distinguish them from the epithelial granular casts. In addition to this the occurrence of hæmaturia would be almost conclusive evidence of the non-existence of chronic desquamative nephritis, the extreme thickened condition of the blood-vessels in that disease rendering the occurrence of renal hemorrhage, at least in the advanced stages, a very rare accident.

In one case of scurvy, I observed yellowish-brown granular casts, which I at first supposed to be indicative of chronic desquamative disease, but which I subsequently found to be composed of disintegrated blood-corpuscles and fibrin. The man quickly recovered under the care of Dr. Todd, in King's College Hospital, and, in a few days, the casts entirely disappeared.

Case III.—[The third case is one of *Acute Desquamative Nephritis, passing into Chronic.* About seventeen years since, the patient, John Revels, æt. 30, had been ill a month with dropsy, but recovered completely. About seven or eight months ago there had occasionally been swelling of the face and hands. His urine was, at that time, very high coloured, like porter, and scanty. He first came under examination on the 17th of November, 1847. Pulse 88; skin cool; tongue clean; no thirst; appetite good; but distressed with the common symptoms of chronic renal disease, flatulence for about two hours after eating.]

He passed about four pints of urine in twenty-four hours, of specific gravity 1012. It deposited a rather abundant dense whitish precipitate composed of dark granular casts (probably disintegrated epithelium;) with some scattered renal epithelion; there was no blood nor crystals; albumen was present in small quantity. The nature and the amount of the sediment at this time indicated rapidly progressing chronic desquamative disease.

[On the 20th Nov. he was admitted into King's College Hospital, under Dr. Todd.]

Dec. 16. I now first observed what I propose to call the "waxy casts" in the urine, mixed with the dark granular casts before mentioned. The waxy casts were of a yellowish white colour, very much resembling wax; they had a well defined outline, and a diameter of 1-400th or 1-500th of an inch; they did not entangle epithelial cells; but some contained, here and there, a few small nuclei, about the size of blood corpuscles.

Dec. 20. The waxy casts were more numerous in proportion to the granular casts. The urine had a specific gravity of 1012; albumen was moderately abundant.

[It was interesting to observe the first appearance of the waxy casts in the urine, and their mixture with the granular ones, which they gradually exceeded. Their appearance in the urine seemed simultaneous to that in the kidney. This waxy material seemed secreted by those tubes denuded of their epithelial lining.

The following are the remarks of Dr. Johnson on the diagnosis of Fatty Degeneration of the Kidney.]

The urine, in cases of fatty degeneration of the kidney, has character suffi-

ciently distinctive to render the diagnosis a matter of ease and certainty. It is commonly of a rather pale, yellowish colour. When first passed, it is clear; but, after standing for some hours, it usually deposits a light cloudy sediment; sometimes, in the early stages, the urine has a dark smoky colour, from containing blood. The quantity secreted is less than normal, and its density in most cases exceeds the healthy standard; it is by no means unusual to find the specific gravity ranging from 1025 to 1030. The albumen is generally very abundant, so that, when boiled the urine becomes almost solid. On a microscopic examination of the cloudy sediment before mentioned, there may be seen transparent casts of rather small size, in many of which are entangled oil-globules of various sizes, also cells containing oil-globules in greater or less abundance. There are besides scattered cells, more or less completely filled with oil.

I might transcribe from the pages of my note-book many cases, in which the urine has presented more or less of the characters here described, and in which not one of the patients has recovered. The majority of these cases have terminated fatally; while, in a few instances, the symptoms continue in a greater or less degree; the urine continuing highly albuminous, and presenting unequivocal microscopical evidence of the true nature of the disease. For the purposes of prognosis, it is as important to distinguish between a case in which the urine presents the characters here described, and a case of simple desquamative nephritis, as it is to distinguish tubercular disease of the lung from acute pneumonia or bronchitis.

Now, since the prognosis in a case of confirmed fatty disease of the kidney is thus unfavourable, it is important that all who examine the matter should clearly understand that albuminous urine may contain a certain amount of oil, entangled in fibrinous casts, or inclosed in epithelial cells; and yet the disease may be of a simple nature, and may speedily terminate in recovery. It is very common to find small quantities of oil in the casts and in the cells, after a simple inflammation of the kidney has existed for three or four weeks. Now, since an inflammatory disease does in some instances become chronic, and terminate in confirmed fatty degeneration, the appearance of any oil in the urine must occasion a certain degree of anxiety, lest it should increase in quantity, and take the place of the simple inflammatory products.—*London Journal of Medicine, Feb.* 1851, *p.* 109.

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## 63.—COINCIDENCE OF ECLAMPSIA AND ALBUMINURIA.

M. Hippolyte Blot submits the following conclusions on this subject:—

1. Albuminuria is frequent in pregnant women. 2. In almost all cases it is the result of a simple functional hyperæmia of the kidney. 3. It is remarkable and inexplicable, that *primiparity* seem to be a predisposing cause. 4. Besides the presence of albumen in the urine, other signs of this condition may be observed,—such as œdema and lumbar pains. 5. The albuminuria of pregnancy is almost always free from febrile excitement. 6. In nearly every instance the albuminuria disappears a few hours after labour. 7. This condition of pregnancy is free from danger when uncomplicated with cerebral congestion; it has no influence on the course or termination of gestation, on the development of the fœtus, on the duration of the labour, nor on the subsequent natural puerperal state. 8. Every state of eclampsia seen by M. Blot has been accompanied with albuminuria. 9. The relation between the two is obscure; they may depend upon sanguineous congestion occurring at the same time in the kidneys and cerebro-spinal centre.—*L'Union Medicale, October* 10, 1850.—*Med. Gazette, November* 22, 1850, *p.* 874.

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## 64.—OCCURRENCE OF STARCH GRANULES IN THE URINE, AND ON THE MICROSCOPIC EXAMINATION OF THIS SECRETION.

By Dr. Thomas Inman, Liverpool.

[Dr. Inman's attention was drawn to this subject by a statement made by Mr. Balman in the 'Medical Gazette,' that he had met with one case in which

the granules were so abundant as to form a distinct deposit, visible to the naked eye. Dr. Inman says:]

I can corroborate his statements respecting the frequency of the presence of granules, and his observation that they consist usually of wheat starch. The fact is one of considerable interest. It is, I think, almost self-evident that they must exist in the urine accidentally, and must be introduced into it subsequent to its passage from the bladder.

We may imagine many ways in which they may be so introduced; the most common is probably the following:—Bread being an universal article of diet, its crumbs are to be found in every house. Falling on the floor they harden, get trodden to dust or powder. When the floor is swept or the foot passes over, the dust rises, and part gets deposited on the internal surface of all the chamber utensils, and of every unclosed bottle. Urine is voided into its usual receptacle, and poured thence into a bottle for examination, and is then found to contain wheat starch.

That such is occasionally the case I may illustrate by the following observation:—The urine of a young man who had signs of a morbid growth in the bladder was given to me for microscopic examination. In it I detected a very minute white mass, like a flake of lymph. It consisted apparently of a number of indistinct reticulations, and a number of cells which closely resembled in their general aspect some animal formations. At last I saw one which had an appearance so like boiled wheat starch that I applied the test of iodine. I then found that all were turned blue, and that the fragment was therefore a piece of bread or biscuit accidentally introduced.

When the quantity of starch is as great as that described by Mr. Balman in the case he narrates, we must suppose that the patient introduces it in some way, either accidentally or with the intention to deceive.

I may add, in corroboration of the idea that in no case, can the starch be a urinary product, that this fluid will entirely dissolve when added to a hot solution. It would equally prevent the formation of the granules.

While on the subject of the urine, I may mention a curious observation I made a short time ago on a specimen sent me for examination. When first seen it contained nothing beyond cubical crystals of oxalate of lime, which existed in immense numbers. Next day *more than* half of these had disappeared, and their place was taken by steller and prismatic crystals of the triple phosphate.

As the phosphatic and oxalic diathesis are supposed to be closely allied, the apparent conversion of one deposit into the other out of the body is particularly interesting.

I scarcely need add that the power used was a quarter-inch of Powell's, that there was no mistaking the one set of crystals for the other, nor was there any opportunity for any practical joker to change the contents of the bottle.—*Med. Gazette, November* 22, 1850, *p.* 879.

# SURGERY.

## FRACTURES, DISLOCATIONS, AND AMPUTATIONS.

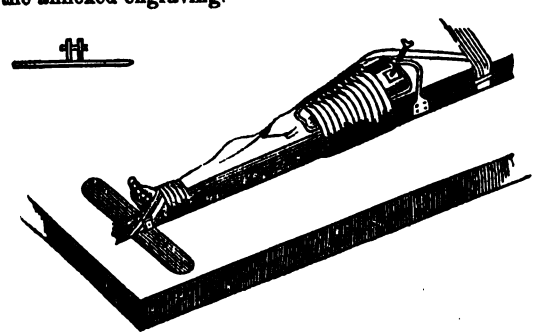
### 65.—CASE OF FRACTURE OF THE THIGH.—MR. WOOD'S IMPROVED SPLINT.

Our readers are fully aware what an unfortunate tendency exists in the upper fragment, when the femur has been fractured at the junction of the upper with the middle third, of being tilted forwards and outwards by the action of the psoas and iliacus muscles. Various contrivances have now and then been added to the long splint to counteract this action; one of these lately attracted our attention as used for a patient under the care of Mr. Ferguson, and introduced by Mr. Wood, the then house-surgeon to the hospital.

The patient is a man of sixty-six years, who was admitted July 25, 1850, for a fracture of the femur, situated just below the lesser trochanter. The accident had been the result of a fall caused by treading on a piece of orange-peel. The actual seat of the fracture having been ascertained, the limb was put up in Liston's long splint, another broad one being adapted to the front of the thigh, and retained by a circular bandage. Matters went on pretty favourably, when about five days after admission, gouty inflammation, to which the patient stated he had been subject, appeared on the great toe of the injured limb. The circumstance of course necessitated the removal of the foot bandage, which was replaced by a loose flannel roller, the toe having first been wrapped up in cotton wool.

When, a fortnight after this, the seat of the fracture was examined, no attempt at union could be perceived, and it was, on the contrary, noticed that the upper fragment was drawn forwards, and separated from the lower by the action of the psoas and iliacus muscles. This want of adaptation caused a projection in front of the thigh, about three inches below the great trochanter, which projection tilted up the end of the broad splint, notwithstanding every adjustment of the bandages. There was also at that time, considerable shortening of the limb, resulting from the necessary loosening of the foot-roller.

In order to remedy the tilting of the upper fragment, Mr. Wood fixed a screw clamp on the side of the long splint, and made it bear on the upper end of the broad one, and the foot bandage was then again tightened, as the gout had luckily disappeared. Attention was now attracted to the lower portion of the limb, as the action of the screw was found to increase the tendency to outward obliquity of the foot, so common and troublesome with the use of the long splint. Under these circumstances, a further improvement in the apparatus was attempted: a long flat piece of sheet-iron, with two uprights fixed in the centre, was placed, transversely, at the foot of the bed; the width between the two verticle pieces being just sufficient to admit the lower end of the splint. The latter was fastened in by an iron bolt, and this arrangement effectually prevented the eversion of the foot, which is unfortunately so often seen after treatment of fractured thigh by the long splint. The whole apparatus is figured in the annexed engraving.



The limb remained perfectly easy and comfortable for about one month after it had been placed as described above, when the splint was removed and the bones found firmly united. On close examination, a slight bend outwards was discovered at the point of union, which evidently resulted from the traction of the perineal bandage in the same direction. This curve in the limb produced a shortening of the limb of about one inch; the limb was a little swelled, and the muscles of the thigh were rather flaccid, from disuse. Stimulating liniments soon dispersed the swelling, and the muscles increased in strength, as the limb was being cautiously used. The patient from his extreme nervousness, and long confinement, acquired very slowly the power of standing and walking with support: but about seven weeks after the accident, he could stand on the injured limb, and walk very nimbly, with the assistance of his crutches.—*Lancet. Nov.* 23. 1850. *p.* 579.

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## 66.—ON THE REDUCTION OF DISLOCATIONS GENERALLY.

By F. C. Skey, Esq., F.R.S.

In the endeavour to reduce a dislocation, the line of traction should hold reference, less to that of the socket, or surface from which the bone has been displaced, than to the more important purpose of easing it from the surface, on which it has lodged. For example, the rim of the glenoid cavity in dislocation of the humerus, presents an obstacle to the extension of the bone in the immediate line of that cavity; but if the bone be drawn off it by extension made in any oblique direction, the instant this ridge is passed, the head will rush back into its natural cavity. So, also, in dislocation of the femur on the dorsum illi, we do not attempt to draw the bone in a direct line with the acetabulum, but we carry it below, round its back and elevated margin, and no sooner does it reach the lower part of the rim, which is much less prominent than the upper and back part, than the muscles immediately restore it to its socket. The same rule holds in dislocation of the ulna and radius backwards at the elbow-joint. I believe the exact line of extension to be much more readily determined, and in truth a less important subject of consideration, than it is generally deemed. I believe, that if we bring the bone sufficiently downwards and place it in the *neighbourhood* of the articulation, the muscles will replace it with as much ease as that which originally dislocated it.

The bone appears, as it were, sucked violently into the socket, even at the instant of its sustaining the greatest force of extension. Then is it, that the muscles acting with one accord, set at nought the extending power, and complete the work of reduction, in defiance of all the agents employed at the moment to prevent it. I consider that the muscles are the immediate agents of reduction, and not the surgeon, whose entire duty consists in placing the bone in a position to give them the opportunity of displaying this harmony of action, and of exercising a power, even beyond that of the mechanical agents of extension. It is this power that succeeds in forcibly drawing backwards the head of the femur into its cavity, when it has fairly reached the rim of the acetabulum, notwithstanding the force employed at that instant, in extending it. In the examples of the larger dislocations, I place no reliance on any of the above-mentioned efforts of manipulation, but depend almost entirely on the act of simple extension, in the fullest confidence of the disposition of the joint to right itself if the obstacles be removed.—*Brit. and For. Med. Chir. Review, April* 1851, *p.* 287.

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## 67.—REDUCTION OF THE DISLOCATION OF THE HUMERUS INTO THE AXILLA.

By F. C. Skey, Esq.

With respect to the plan of placing the heel in the axilla, it should be constantly kept in mind that the shoulder-joint has this peculiarity in its construction, viz., that it is composed of two bones, each of which is moveable on the trunk, and that, in the act of extension, we not only affect the position of the

bone we are extending, but through the agency of the muscles connecting them, we also affect the relations of the bone we are extending *from*; and in the case of the humerus and scapula, that the agents of extension do affect both bones, cannot be doubted. By fixing the scapula, we retain the glenoid cavity in a direction looking straight outwards from the trunk; but if we leave the scapula untouched. then, by the act of drawing down the humerus, we depress at the same time the acromion, by means of the deltoid which is attached to both. The consequence is, that in depressing the acromion we *direct the socket of the bone towards the dislocated head*, and readily get rid of the obstacle, which is often immediately caused by the rim of the glenoid cavity alone, and we bring the two surfaces of bone within the range of what I may term their natural affinity, and by the agency of which they immediately coalesce. With the heel in the axilla, we make a simple extension of the arm from the wrist; we leave the scapula unfettered, to assume its own direction; and by the extending force, slightly as it is applied by one person only, *the scapula is made to revolve on its centre, through the leverage exercised on the acromion by the deltoid*; and the pectoralis major and latissimus dorsi, being thus relaxed, exercised no prejudicial influence on the movements of the humerus. I have seen the protracted efforts of pullies, drawing outwards, fail again and again, with the utmost effort, when the head of the bone has been restored to the glenoid cavity, by the single agency of one person subsequently placing his heel in the axilla.

There is no reason why, in very muscular subjects, or in old dislocations, the same principle may not be applied conjointly with the use of pullies. For the purpose of retaining this admirable, because most efficient, principle, I employ a well-padded iron knob, which may represent the heel, from which there extend laterally two strong straight branches of the same metal, each ending in a bulb or ring of about four inches in length, the office of which is designed to keep the margins of the axilla as free from pressure as possible; for what operation can be more absurd than the endeavour to fix the scapula by means of girds carried round the shoulder, in which we include the margins of this cavity, viz., the pectoralis major and latissimus dorsi, as in a vice, and by which we endeavour to drag up the arm, *at the same instant that we make the most strenuous efforts to drag it down by a yet superior force?—Brit. and For. Med. Chir. Review, April*, 1851, *p.* 287.

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## 68.—ENCEPHALOID TUMOUR ROUND THE FEMUR—AMPUTATION.

(Under the care of Mr. Charles Gardiner Guthrie.)

[By the labours of Laennec, Cruveilhier, Müller, Carswell, &c., the classification of malignant growths, founded upon well-defined characters, affords great assistance to us in practice.]

If we are not greatly mistaken, three types of cancerous growths have now taken a prominent and very clear position—viz., scirrhus, encephaloid disease, and colloid growths. The latter is so rare, that it hardly need arrest attention, and the mind of the student, and even practitioner, feels at ease, the diagnosis being thus assisted by a definite idea of certain well-recognised types. It matters not whether we call these types scirrhoma and cephaloma, after Dr. Carswell, or whether we retain the above names, which seem to be the most current among surgeons.

Difficulties may be thrown in the way when we attempt to recognise either of these types, either from the locality in which they may have sprung up, or from their resemblance with growths acknowledged as non-malignant. Thus it may happen (confining our attention to encephaloid disease) that this affection may be confounded, when in a softened state, with chronic abscess, serous or hydatid cysts, fatty tumours, or the hypertrophy of certain glandular organs, as the mamma or thyroid body. A due amount of care will, in general, surmount the obstacles which lie in the way of a correct differential diagnosis.

When once the malignancy of a tumour has been made out, it will be ascertained, without much difficulty, whether the growth belong either to the first

or second type; but another question, the solution of which has an immense influence on the treatment, is to determine whether the patient is to be operated on at all; and, when surgical interference is resolved upon, to make a choice between the ligature, caustic, extirpation, or amputation. And even when the latter operation is fixed upon, the surgeon has still to decide whether he will, supposing a tumour of a malignant kind to have involved a limb, amputate in the shaft of certain bones, or take off the limb at the joint above.

These considerations came very forcibly before us when witnessing an operation lately performed by Mr. Charles Guthrie, at the Westminster Ophthalmic Hospital, his patient being affected with an encephaloid tumour of the thigh. The case created very great interest, both on account of the doubt which existed regarding the extent of the disease, and the numerous surgical authorities who were called upon to give their opinion as to amputation or disarticulation. But the very interesting nature of the case will appear by the outline, which we proceed to give.

The patient is a young man, twenty-four years of age, of a decidedly strumous diathesis, who was admitted under the care of Mr. Charles Guthrie on November 11th, 1850. About eighteen months ago, he was attacked with a pain in the thigh, which to him and to others seemed of a rheumatic character. This affection was variously treated, with no benefit, when, about six months ago, a swelling was noticed at the posterior part of the thigh, about the situation of the commencement of the linea aspera. This tumour increased rather slowly at first, but about six weeks previous to admission, it began to gain rapidly in size.

We cannot here help remarking the fact of the growth having in this case sprung up without any external violence. This circumstance is an additional proof, if any more were necessary, that the falls, blows, &c., which generally are said by patients to have given rise to malignant tumours, are but slight exciting causes which have acted on parts already fully predisposed. Had this patient met with a fall on the part which eventually became spontaneously affected, the tumour would probably have made its appearance soon after the fall.

On admission, the growth was found to have surrounded the upper part of the femur: it had attained the dimension of a man's head, and yielded to the hand the sensation of a soft pulpy substance. The skin was of a purplish hue in front, somewhat stretched over the tumour, and permeated with large veins; the patient complained of a constant aching pain in the part, and seemed to have suffered materially in his health. Mr. Guthrie examined the tumour carefully, and pronounced it an encephaloid growth; it could, however, not be ascertained whether the diseased mass sprang from the bone itself, or from the surrounding parts, or to what extent the former might be involved. As to the nature of the affection, there could hardly be any doubt; its rapid growth, the age of the patient, his deteriorated health, the form and feel of the tumour, &c., all clearly pointed to an encephaloid affection. But two questions arose immediately from this diagnosis—Is it proper to amputate? and, where is the operation to be performed?

First, as to the propriety of removing the disease. It was certainly one of those cases where such a measure might be attempted with a very fair prospect of freeing the system altogether from the malignant influence, as the disease was of very short standing, the patient, though weak, not affected with any visceral complaint, and the cancerous affection not hereditary in the family. It could not be discovered that the lymphatics or glands had been much contaminated by the disease, and the case might altogether be looked upon as one favourable to operation. It is, of course, the probable reappearance of the affection, either in some of the viscera or in the stump, which renders the surgeon cautious in advising operations. It is not quite proved, as yet, that encephaloid growths are principally to be attributed to an alteration of the blood, though the recurrence of the disease goes far to support this opinion. Yet, as the affection has in some cases not reappeared after the removal of the primary local manifestation, it may be inferred that at some particular period the malady is quite local. And even supposing the blood contaminated with

cancerous matter, it is difficult to understand (as has been very properly objected) that particles of cancerous matter, carried into an organ by the blood, should there have the power of increasing and multiplying.

Mr. Guthrie having considered this as a fit case for the removal of the limb, the next question was, whether the femur should be amputated near the lesser trochanter, or removed at the hip-joint. This problem was not easy of solution, as certain elements were wanting to solve it, for it could not be ascertained whether the encephaloid growth sprung from the bone or not; and supposing it had originated from the femur, it remained to be found out whether the disease extended sufficiently high up to warrant amputation at the coxo-femoral articulation.

If we look into Mr. Stanley's work on 'Diseases of the Bones' we find the following passage bearing upon this point:—"Still, the ascertained fact of the encephaloid tumour being occasionally combined with unsoundness of the bone to an indefinite extent, is sufficient to warrant the rule, that in such cases the amputation should, if possible, be performed, not through the bone in which the disease originated, but either through the contiguous joint or above it." The advice contained in this quotation is sufficiently distinct, and Mr. Guthrie was fully inclined to follow it; but Messrs. Arnott, B. Cooper, Guthrie senior, Stanley, B. Phillips, Travers, Tatum, H. C. Johnson, Hancock, and Avery, having been consulted on the subject, it was agreed that the limb should be taken off at the lesser trochanter; that Mr. Stanley should examine the tumour and bone immediately, and if the latter were found involved, the disarticulation should at once take place, but that the hip-joint was not to be disturbed if the bone were sound.

And here we may be allowed to recall to the memory of our readers an extremely instructive case, some time ago, under the care of Mr. Prescott Hewett, at St. George's Hospital, and which we had the pleasure of reporting ('The Lancet,' Dec. 8, 1849, p. 615; and Aug. 24, 1850, p. 245). Here the disease recurred in a comparatively short time, in the stump, after the femur had been amputated high up; but the encephaloid tumour was of the periosteal kind, and therefore identified, as it were, with the osseous tissue. This was not the case with Mr. Guthrie's patient, as will be seen by the sequel; the amputation has taken place in both cases, at about the same situation, but the origin of the tumours is not exactly the same.

Mr. Guthrie proceeded to remove the thigh as high as the lesser trochanter, assisted by Messrs. Hancock, Holt, Canton, &c., the patient being rendered insensible by the inhalations of chloroform, which acted very rapidly upon him. Mr. Echlin being desired to compress the femoral artery close to Poupart's ligament, Mr. Guthrie commenced his first incision from the external side of the artery, very near the above named ligament, and carried it round across the glutæus to a point situated above the tuber ischii, the knife being made to divide the skin and subcutaneous cellular tissue. The second incision ran round the inner side of the thigh, beginning on the internal side, and somewhat over the artery, and was carried below the pubis, to meet posteriorly the termination of the first. The muscles were then dissected upwards and inwards from the great trochanter, so as to form the outer flap, the operator being thus able to feel the denuded lesser trochanter with his finger, this being one of the guiding points sought for. The knife was then carried on the inner side of the bone, from without inwards, and made to divide at one sweep the vessels and muscles down to the lesser trochanter. The bone was now fairly exposed, and the saw being applied somewhat obliquely from the greater to the lesser trochanter, the limb was thus completely severed from the trunk.

Mr. Stanley and Mr. Quekett immediately proceeded to examine the parts whilst the arteries were being secured, and after a careful dissection they came to the conclusion that the bone and medullary canal were perfectly sound; the flaps were therefore brought together without any further removal of parts. The patient, as we stated above, had been narcotized by chloroform, and remained in a deep sleep whilst so important a portion of his frame was being removed; but he did not recover his faculties as quickly as is usual in

similar cases; he remained, in fact, in a sort of swoon, from which he rallied about an hour after the operation, all proper means being taken for reviving him. It should be noticed that the room was extremely crowded, and that the patient, in his very weak state, probably inhaled a large proportion of carbonic acid along with the chloroform, and was, moreover, under the depressing influence of a heated atmosphere. He was roused, however, soon after the room was completely cleared. The patient has progressed very favorably up to this date, and we sincerely hope that he may remain free from any further inroads of the malady for which he was operated on.

Mr. Quekett, having had the parts removed to the College of Surgeons, examined them again with great care, and kindly communicated to us the following particulars regarding the pathological appearances of the tumour. Both by the naked eye and the microscope the bone was found quite healthy, and some yellow specs seen on the day of the operation in the medullary canal, and supposed to be composed of pus, were discovered to consist principally of fat. The tumour evidently did not spring from the bone, but had clearly arisen between the muscles of the thigh, and lay around the femur. (Dr Carswell says that malignant disease may begin as a molecular deposit in the tissues affected, from a derangement of their nutrition. We would add, that in a case like the present, such an hypothesis comes very near the truth, as there is no hereditary taint in the family.) The growth is of the common medullary or encephaloid kind, composed of nucleated cells, with no fibrous tissues connecting them together. The external aspect of the tumour is nodulated, and covered by a thin pellicle. On a section being made, the central part was found soft and pulpy, and studded with white spots, composed chiefly of earthy matter, which bore much resemblance to the cysts of the trichina spiralis. By a transverse section it was shown that the muscles invested the tumour; but at one part of the growth it was noticed that the latter was gradually burrowing down to the sciatic nerve. One large nodule looked very vascular, and being cut through, showed a great congeries of vessels.

[It may here be noticed, that some French pathologists, among whom is P. Bernard, are disposed to think that the encephaloid tissue is deprived of veins; whilst Laennec thought that these growths possessed a complete system of circulation. If the former opinion is eventually found the true one, the circumstance will have a material influence on the question of the recurrence of cancerous growths.] Sections of the bone were made in various points, but the osseous texture was everywhere found perfectly sound, the compact portion appearing to the naked eye perfectly firm. The circumference of the tumour, divested of all appendages, was about seventeen inches, and its weight four pounds.

In reviewing the characters above enumerated, it would appear that this tumour may be classed among the non-encysted variety of Laennec. This author says, after describing the peculiarities just mentioned: "The non-encysted encephaloid tumour may be found in all parts of the body, especially in the lax cellular tissue so abundant in the limbs or the great cavities; they are found most often in the arm, *the thigh*, and the neck." Mr. Stanley mentions an example of a tumour of this kind originating in the cellular tissue. He says:..... "to this I know but a single exception, in the instance of an encephaloid tumour filling the ham, and then advancing upon the sides of the knee; for here the disease appeared to have originated in the cellular tissue of the popliteal space; certainly it had no connection with the adjacent bones, which were sound."

As the operation has been performed early, and the whole of the diseased parts removed, we may reasonably harbour the hope, that no recurrence will take place, and we shall conclude with quoting from Nélaton's 'Parthalogie Chirurgicale,' the following passage, which bears mainly upon the question of recurrence:—"Encephaloid substance is, according to Lobstein, composed of albumen and gelatine; treated with boiling water it yields a dull fluid, which, being evaporated, leaves a residue of gelatine and phosphate of lime. Boiling alcohol separates the gelatine, and the matter which is then left, and which has resisted the action of boiling water and alcohol, resembles fibrin or gluten;

this residue is made to swell up considerably by the addition of acetic acid. This last substance, according to Gluge, is composed of spherical globules, the smallest of which are larger than the pus globules; they are found not only in the diseased tissues, *but likewise in the neighbouring parts.*" This latter remark, if proved true by further experiment, would have a great importance in practice; for it would explain the frequent recurrence of encephaloid disease, and would show the necessity of taking off, with the tumour, all the layers of the sound tissues in which these germs, as it were, of the cancerous affection, are contained.—*Lancet, Nov.* 30, 1850, *p.* 603.

## ORGANS OF CIRCULATION.

### 69.—PRACTICAL RULES ON THE SUPPRESSION OF ARTERIAL HEMORRHAGE.

By Professor Syme.

In the first place, you should hold it established, that it is always desirable, if possible, to arrest bleeding from arteries by means applied at the seat of injury. Secondly, you may be assured that bleeding at and below the wrist, and at and below the ankle, is always under the control of pressure, provided it be properly employed,—that is, not superficially, but from lint, or some other suitable substance being introduced into the wound, and made to press directly upon the orifice of the vessel. Thirdly, in wounds of all arteries, accessible between the limits just mentioned and the heart, the vessel should be exposed at the seat of injury, and tied on both sides of the wound it has sustained. This principle has been so loudly maintained by Mr. Guthrie, that I believe some people have given him the credit of its origin; but it has been long established as a sound principle of practice by surgeons of the highest eminence both at home and abroad, and more especially by Mr. John Bell, of Edinburgh, in whose 'Principles of Surgery' you will find many graphic and impressive lessons of the effects resulting from attention to it, and also from its regard.

One evening I received a message from the Northern Railway, that there was a steamboat waiting at Granton to carry me across the Firth to Burntisland, where a special train would be ready to proceed onwards, but whither, or for what purpose, there was no information. Having travelled a considerable distance, I met several practitioners, of great experience and intelligence, who were suffering much anxiety in regard to a youth, in whose forearm an incision for an abscess had bled profusely. As it was quite away from the radial artery, the ulnar was concluded to be the source of hemorrhage, and had been sought for by dissection upwards towards the elbow, along the course of the muscles, between which it is wont to run, but without success; and, as the patient seemed little able to bear any further loss of blood, it was deemed desirable to have a consultation as to the most efficient measure of relief, even though it might involve ligature of the humeral artery, or removal of the limb. Acting upon the principle above mentioned, I scratched away the clot at the bleeding point, from which a copious stream instantly issued, but arresting this with my thumb, pressure being at the same time made upon the humeral, I dissected a little through the adjacent texture, and brought into view a large artery, under which a double ligature was passed, and tied on both sides of an aperture distinctly visible in its coats. In less time than I have taken to describe the process, the patient was thus transferred from a state of extreme danger to one of perfect safety. The artery was obviously the ulnar, which had come off higher than usual from the humeral, and pursued an irregular course externally to the fascia of the forearm, thus explaining how it had been wounded by the superficial incision, and how it had escaped the deep dissection.

The fourth rule I have to offer is, that when an aneurism forms after the wound of an artery, the same means should be employed as in the first instance, unless the vessel concerned be of a large size, and admits of having a

ligature applied to it, without the intervention of any large branch between the seat of obstruction and the wound. The formerly not uncommon case of aneurism at the bend of the arm, as a consequence of the humeral artery being wounded in venesection, affords a good illustration of the advantage resulting from attention to this rule. since relief was thus afforded much more easily, safely, and securely, than by ligature of the humeral further up the arm.

To illustrate the exception mentioned, I may relate the case of a young man who, in one of the most remote of the Orkney Islands, accidentally thrust the blade of a knife into the middle of his thigh, so as to wound the femoral artery. The blood gushed forth with great violence, but was restrained by a compress, formed of eight half-crowns, wrapped in a piece of cloth. The wound healed, and an aneurism soon afterwards appearing, he was sent here to my care. Respect for the general principle, and suspicion from the purring sound, that there was a communication between the artery and vein, suggested considerations which were opposed to ligature of the femoral, but I nevertheless preferred this operation, as the ligature could be applied without the intervention of any considerable branch; and I accordingly performed it, with the happiest result.

The following case will show the danger of not strictly limiting exceptions to the rule within the limits which have been mentioned. A middle aged woman, in a country town, while walking up a steep and slippery ascent, and carrying a knife, with which she had just killed a pig, fell, and thrust the sharp point of the blade completely through her leg, a little below the knee, entering between the tibia and fibula, and issuing at the lower part of the popliteal space. Blood gushed from both openings, but when she was laid in bed ceased, and did not return. At the end of a fortnight, the wounds having healed, she attempted to walk and found that a swelling had taken place at the seat of injury, on account of which, by the advice of her medical attendant, she came here to be under my care. On examination, I found a large pulsating tumour in the forepart of the leg, immediately below the knee, and another of equal size in the popliteal cavity.

Feeling unable to determine whether the anterior or posterior tibial, or the popliteal artery itself, was the vessel wounded, and, on the whole, being inclined to think that the one last mentioned was most probably concerned, in which case ligature of the femoral would be the proper course, I adopted this measure. No bad consequences followed the operation, the tumours ceased to pulsate, and favourable expectations were entertained of the result for two or three weeks, when the anterior wound below the knee opened and bled profusely. I dilated it freely, evacuated the cavity of its fluid and coagulated contents, and applied firm pressure between the tibia and fibula, whence the blood was found to issue. Mortification followed, and I performed amputation, without saving the patient's life. There can be no doubt that, in this case, if the true state of matters could have been ascertained, and a ligature applied to the anterior tibial, which was divided just before it passed through the interosseous ligament, both the limb and life of the patient would have been preserved.—*Monthly Journal of Med. Science, April*, 1851, *p.* 370.

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## 70.—ANEURISM OF THE RADIAL ARTERY.

By Professor Syme.

[In this case, a man of thirty years of age, had at the root of the thumb a tumour about the size of a flattened gooseberry, and stated that the ligature of the artery at the wrist had been recommended as the remedy.]

The swelling looked so much more like a ganglion than an aneurism, that I supposed there must have been a mistake as to its nature; but, upon a more attentive examination, finding that there was a distinct expansive pulsation, I could not doubt that there was a sac communicating with the radial artery, pressure upon which instantly lessened the swelling, and deprived it of the pulsating character. I therefore had a little spring constructed, upon the principle of a rupture truss, so as to press upon the vessel at the wrist, and at the end of

twenty-four hours after it had been applied could not detect any trace of pulsation.

I recollect a somewhat similar case, in which a young military officer, from falling on the ice while skating, received a severe blow on the temple, whence resulted a small pulsating tumour, the size of a field bean. As the disease was so small in extent, and so distinctly limited, I cut through the sac, and tied both of the bleeding orifices. The patient suffered no further trouble either from the operation or the disease.

It may appear inconsistent in me to apply pressure at the wrist, instead of tying the the radial artery, as I have strenuously contended against the substitution of pressure for ligature of the femoral artery. But the two cases are very different, since the latter-mentioned vessel has accompanying it the great venous trunk of the limb, which the utmost extent of human skill and care cannot prevent from being compressed along with the artery, and necessarily occasioning a degree of suffering to the patient which must, if at all prolonged, infinitely exceed the trivial disturbance which attends ligature of the artery,—while the radial artery lies directly under the skin, rests upon the bone, and has no associate disposed to resent the effect of compression. I may add, that it has always been an established principle with me, that the radial artery and its branches at and below the wrist are completely under the command of pressure.—*Monthly Journal of Med. Science, April*, 1850, *p.* 370.

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## 71.—METHOD OF MAKING THE INCISION FOR THE EXPOSURE OF ARTERIES.

By F. C. Skey, Esq., F.R.S.

I almost invariably adopt an *oblique incision*, and generally at an angle with the artery of 45°, on the following grounds: that in fat subjects it is difficult to ascertain the exact line of the vessel, and that, however true the first incision may be, it does not follow, in the course of a slow and bloody operation, that the same line will be preserved; that if, from accidental circumstances, the precise position of the artery be lost, the operator is equally uncertain whether he is dissecting on the inner or on the outer side of the vessel, or upon it; that, by dividing across the direction of the vessel, he acquires a confidence, from the conviction that the artery is really under his knife; and, lastly, that he makes an external wound, within which the ligature needle is more readily carried round the artery in a fat subject, in which the vessel lies deep, than in a wound parallel to it. The objection to a directly transverse wound is, that the artery is exposed only in a transverse line, and there is nothing gained, but much may be lost. In the femoral, brachial, radial, and ulnar and posterior tibial, I consider the oblique incision to be an important element of success in finding the artery with facility. Take the example of the posterior tibial artery, how preferable is it, to make an external incision over this deeply-seated vessel across the line formed between the muscles that surround it, to the endeavour to hit the exact line, where the deviation of one eighth of an inch would carry the surgeon into the substance of either of two muscles, neither of which he would be able to distinguish from the other! I remember, many years since, to have seen a practised operator totally fail in his attempt to tie the ulnar artery immediately above the wrist, from this difficulty.—*Brit. and For. Med. Chirurg. Review, April*, 1850, *p.* 290.

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## 72.—EXPOSURE OF BLEEDING SURFACES TO THE AIR, A MEANS OF ARRESTING HEMORRHAGE.

By F. C. Skey, Esq., F.R.S.

In cases of hemorrhage from small vessels, there is, in my experience, no agent at all comparable in its power to arrest bleeding, like rest and exposure to air. Whether it be the act of exposure to the atmosphere, or that the vessels are freed from the contact of parts around, I do not know, but the fact is undoubted. The surgeon who has least fear of hemorrhage loses the least blood. A small wound may be tortured by styptics, and by compression, and

by other unprofitable agents, until it becomes the fruitful source of protracted hemorrhage. Masses of lint are piled up in heaps upon the wound, pressure is maintained till all the parties concerned are exhausted, but still the hemorrhage returns or continues, by reason of the irritation caused by the very agents employed, and nothing more.

Under these circumstances, which I have repeatedly borne witness to, all dressings should be removed; the wound should be opened and exposed to the air, by its edges being drawn widely asunder, and the bleeding apparently encouraged; its surface freely sponged with cold water, the coagula wiped away, and in this condition it may be fearlessly left to bleed. The cessation of the hemorrhage by such means is often immediate. I was called up at an early hour, many years since, by a medical man, to consult with him on a case of hemorrhage from a tonsil which he had removed in the middle of the previous day from the fauces of a young lady. I directed him to take her to an open window, on the side of the house from which the wind blew, and to require her to keep her mouth wide open. On the following day, I learnt that the bleeding, by this simple expedient, had almost immediately ceased. A gentleman, in a state of intoxication, fell down and cut his head. The wound bled freely from the secondary branches of the temporal artery. This hemorrhage continued from seven till twelve at night. When I saw him, his bed was surrounded by some six persons, medical and domestic. The man had a pile of lint of about three inches in thickness on the wound, and another layer was about to be added to the mass. Contrary almost to the entreaty of the parties engaged, I removed the clotted and saturated lint, and roughly sponged the wound, which I exposed to the air. The bleeding ceased within three minutes. On another occasion, I was sent for in the night to the hospital, to assist in arresting the bleeding from a large wound below the axilla, that had been made on the previous day, by my late colleague, Mr. Earle. Three house-surgeons were present and other persons. This man had lost a large quantity of blood by the same ingenious devices as those practised in the above cases. I proposed to remove the lint, and I was answered that its removal would be fatal, such was the tendency to bleed. I ordered the man's bed to be carried to an open window, and removed every appendage from the wound. A large flow of blood followed and then entirely ceased. I have records of many other similar cases.—*Brit. and For. Med. Chirurg. Review, April*, 1851, *p.* 290.

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## 73.—VARICOSE VEINS CURED BY THE FORMATION OF SMALL ESCHARS.

By F. Skey, Esq., F.R.S.

Any number of eschars may be made on the diseased veins; I have made as many as nine on one leg at a time, selecting for their application the most prominent parts of the disease upon which the eschar is to be made. The size of these eschars, regulated by that of the aperture made in three or four layers of good adhesive plaster, is of great moment. They cannot well be made too small. I formerly cut an opening of the size of a shilling, but this involved the surrounding skin beyond the margin of the vein, and an ulcer of unnecessary magnitude followed, that was difficult to heal; for in all these cases, consequent upon the peculiarity of constitution I have alluded to, the healing action is exceedingly slow. Those that I now employ are less than a fourth part of that size, sometimes but little larger than the diameter of a split-pea, the number of which may be regulated by the extent and complication of the disease. The smallest size is sufficient at once to obliterate the vein. Whatever number be made, the entire operation should be completed at once. The region of the ancle may require two, three, or more, placed over the early branches of the vein. One or two may be applied on the trunk of the vein up the calf, and others below the knee. I have made these eschars also above the knee, but not frequently, not because there is any danger attending it, but because the diseased condition of the vein does not appear to require it. When the places for the application of the caustic have been selected, and the plasters firmly fixed, the ingredients of the paste should be mixed and pasted on

the aperture within them. A piece of plaster should be laid over each quantity, and the whole may be removed in from twenty minutes to half an hour. It will then be found that the veins are obliterated, in fact, they have disappeared. Rest in the horizontal posture is desirable, but not essential. In the course of a week or ten days, in a moderately vigorous circulation, the eschars will separate, and the process of healing should then be vigorously pushed, by the aid of bark, wine, good diet, and the local application of adhesive plaster, and stimulants if necessary. Occasionally the ulcers heal very torpidly, and may occupy many weeks.—*Brit. and For. Medico-Chirurg. Review, April*, 1851, *p.* 291.

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## 74.—ON THE TREATMENT OF NÆVI AND SMALL VARICES.

By Dr. B. G. Darley, Physician to the Coolock Dispensary.

[In infants these affections are generally congenital, but they are also met with in children from the ages of six to fourteen or fifteen. In females, when they appear upon the face, they are naturally the cause of much anxiety to parents. Though in growing up children they do not often increase to any large size, nor will they burst and bleed as some species of aneurismal varices do. Dr. Darley proposes a very safe and simple method of removing those met with in growing up children.]

First with regard to infants; the head is very frequently their seat; so are the back and the abdomen: they are often flat, and embrace a considerable portion of skin, which is a purplish colour, with innumerable vessels, filled with blood, running through it. The blood can be squeezed out by pressure, but returns again when the pressure is taken off. I have seen one such as this occupying a considerable space round the umbilicus. Another kind is round and elevated, varying from the size of a small nut to that of a large cherry or walnut; this, from the congeries of contained vessels, gives to the touch the well-known wormy feel. One of the best methods of removing these is by passing threads steeped in a solution of sulphate of copper or of some other caustic astringent through the tumour. I remember one remarkable case of this species being brought to me; the tumour was the size of a moderate Spanish nut, and situated on the head of a child of a few months old. I told the mother that she ought to have it removed by a slight operation, and that if neglected, it would surely end unfavourably; she told me afterwards that her husband would not allow of any operation.

Some months afterwards I met this woman; having previously heard that "the child was cured," I asked to see its head. The tumour was perfectly gone, and the part, though slightly marked, was as flat and smooth as the rest of the skin. After some difficulty I got her to acknowledge that "a charm" had been performed; the charm was this: the child was brought to a house where a man had recently died, and, the dead man's hand was rubbed a certain number of times upon the tumour and after this the tumour gradually disappeared. I did not attempt, as it would have been a difficult undertaking, to persuade the mother that this was not the cause of cure. I mention it, however, partly to show the tendency these tumours have to contract and disappear.

The forms of these tumours which we frequently meet with, are situated on the face of young persons; they vary from the size of a pin's point to that of a grain of barley. They are of two kinds, one a small round, red, isolated tumour, which, when examined through a lens, shows a congeries of vessels running in a tortuous manner, and enveloped in a little cyst; the other, a small tumour, with a number of little vessels running in a stellated manner to it, as to a common centre. The blood can easily be emptied by pressure out of these little vessels.

Mrs. G. consulted me about her little girl, a child of seven years old, who had one of these small varicose tumours under the left eye; the tumour itself is not larger than the head of a pin, but there is a lash of small vessels running in a stellated form to it, so as to give a very remarkable appearance. The mother is very desirous to have it removed, as she thinks it is increasing in size. The operation was performed thus. I first, with a lancet, made a free opening

through the centre of the tumour; all the blood in the small vessels, as well as that in the tumour, immediately flowed out. I then, with a pencil of nitrate of silver, cauterised the exposed surface of the tumour strongly, holding the caustic in contact with the tumour for some time. A superficial black eschar was formed, which separated in the course of a week, when the tumour and all appearance of the small blood-vessels, were gone; and in a very short time there was not only not the slightest depression felt, but not even a mark to be seen. This mode of performing the operation is both safe and expeditious; it does not leave the deep pit I have seen after the operation with caustic potash, as used by some surgeons; and the application of the lunar caustic by itself, without the incision, frequently fails; or, if it succeeds, it is after a great many applications. It has been proposed to insert an acid into these little tumours, by means of capillary tubes, with the view of effecting a cure, I have not seen this latter operation tried; but I shall be satisfied if this *proposed method* of mine will do away with that barbarous plan of taking a piece of flesh out of such an exposed situation as the face, which the operation with the caustic potash inevitably does, and which produces an unpleasant reminiscence of the surgeon and his operation every time that the pit which it has left is observed.—*Dublin Quarterly Journal of Medical Science, Feb.*, 1851, *p.* 50.

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## 75.—SUBCUTANEOUS APPLICATION OF THE LIGATURE FOR DEEP-SEATED NÆVI.

By JOHN ADAMS, Esq., Surgeon to the London Hospital and Lecturer on Anatomy.

[The first object in the cure of nævi, is to save the skin, which covers them, from destruction. Hence the use of the seton, the couching-needle, injections of irritating lotions, the introduction of probes armed with nitrate of silver,—nay even the actual cautery, all employed with the view so to inflame the cells and blood-vessels of the tumour as shall completely obliterate them. But, says Mr. Adams,]

It has suggested itself to me that a ligature might be so employed as to embrace the whole of the disease without compromising in any manner the vitality of the superjacent skin; and the following is the plan I put into operation in a recent case:—

The disease occurred in a child six months old, and was situated on the right cheek, close to the nose and just beneath the eyelid. The tumour was somewhat oval, its long axis vertical, and, although the disease was principally in the subcutaneous vessels, yet the veins of both upper and lower palpebra was somewhat varicose.

I introduced a long needle with a ligature, only slightly curved on the flat towards the point, and carried it through the side of the tumour in its long axis, from below upwards; having drawn out the needle on the opposite side, I re-introduced it on the other side of the tumour, at a point on a level with its point of exit, and brought it out opposite the point of its first insertion. If I had now tied the ligature I should have encircled the whole of the tumour, but there would have been great puckering of the skin at the upper and lower edge, whilst the skin on either side would have been free. To obviate this inconvenience, therefore, I cut through the skin above and below, from the point of insertion to the point of exit of the needle, and, having tied the ligature firmly, I endeavored to strangulate the tumour.

In this case the success was not complete, and I believe the want of success arose from my having, on the fourth day, divided the knot with a pair of scissors, and removed the ligature before the disease was effectually destroyed.

This method of procedure is founded on the assumption, that subcutaneous nævi are supplied by vessels springing from below rather than by those of the skin. This, however, is not always the case, and I am inclined to think that in the instance just related there were many vessels passing into the tumour from the skin.

I am not aware that this mode of applying the ligature has been put in practice before; it is exceedingly simple, and, as it in nowise compromises the vitality of the skin, I think it deserving of a fair trial.

In another case I certainly should allow the ligature to remain, until, by gentle and gradual traction of its ends, which should be left of about two inches in length, it could be made to cut its way through the base of the tumour, thus completely detaching it from its subjacent connexion.—*Med. Times. Feb.* 15, 1851, *p.* 178.

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### 76.—ON THE EXTIRPATION OF ERECTILE TUMOURS BY THE CAUTERY.

In his 'Lectures on General Therapeutics,' Dr. Douglas Maclagan makes the following remarks: "These erectile tumours, which consist essentially of a congeries of enlarged blood-vessels, are commonly treated by ligature; but this causes a good deal of suffering, and often much constitutional irritation, before the strangulated mass finally separates. The method of applying the cautery is to pass a large red-hot surgical needle, which may be readily heated by a gas-flame, once or twice through the base of the tumour; and the object is to cause effusion of lymph, and thus to alter the structure of the tumour, and to arrest its growth. There are other means of effecting this object; but I mention this as one which, though noticed in surgical works, has not received that attention which I think it deserves."—*London Journal of Medicine, January*, 1851, *p.* 71.

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## ALIMENTARY CANAL.

### 77.—OBSERVATIONS ON HARE-LIP.

By W. Fergusson, Esq., F.R.S.

'Mr. Fergusson first alludes to the case of a girl with a hare-lip in which the operation ordinarily performed for its relief had failed. The father of the child had invented an apparatus which kept the parts together after the operation much more effectually than the means commonly used. Being pleased with the instrument, Mr. F. determined upon trying it.]

The apparatus differs from others in general use, because, instead of drawing the parts towards each other, it, as you readily can perceive, *pushes* them together. On that account it is superior to those ordinarily used, as they generally act by pulling the parts together, and it is difficult, in using them, to keep the pressure from the cicatrix; thus there is an objection to them. The idea of pushing the parts together is excellent. The drawing, by Dr.

Westminster, represents the apparatus applied. The inventor's name is Hainsby, and he lives in Denton-street, Somers-town.

There are instances of hare-lip in which a surgeon will not like to operate in consequence of the great amount of tension which will be exerted upon the edges of the wound, which will almost with certainty burst open again. Now, in such cases, an apparatus of this description, and acting in this manner, will be of essential service. Its great advantage is, that it can be easily borne by a child, whereas, with those ordinarily employed there is great difficulty in getting the patient to bear them on.—*Med. Times, Dec.* 21, 1850, *p.* 641.

[Mr. Robert Annan, surgeon, of Kinross, has stated that two similar apparatus to that described by Mr. Fergusson, in the Medical Times for December 21, 1850, have been previously mentioned, one in the London Medical Review, for 1801, extracted from a memoir of Mr. Ollenroth, surgeon; and the other in the Edinbro' Medical and Surgical Journal, of the 1st of July, 1830. The latter are stated to be much more simple though identical in principle with that of Mr. Fergusson. This was brought into notice by Mr. Dewar, of Dumfernline.

"It occurred to me," says Mr. Dewar, "that, as a very slight degree of pressure on the cheek, on each side, near to the corner of the mouth, relaxes the upper lip, a narrow piece of steel, having a spring, might be so adapted as effectually to answer my purpose. I had, accordingly, a spring made, nearly resembling a pair of sugar-tongs, and so padded as to press on the cheek near the mouth. It was kept in its place by a narrow tape, tied over the chin, and by three tapes which were fastened, one behind and one on each side, to a piece of leather placed on the crown of the head. This simple contrivance answered every purpose admirably. I could relax the lip by it to any degree I wished, and it could be worn without the smallest inconvenience. The strain was thus taken off the pins, and the process of healing advanced in the most favourable manner."—*Med. Times, January* 25, 1851, *p.* 104.

## 78.—CASE OF HARE-LIP WITH A LARGE PORTION OF THE SUPERIOR MAXILLARY BONE PROJECTING THROUGH THE FISSURE, CURED BY OPERATION.

By E. A. Lloyd, Esq., Surgeon to St. Bartholomew's Hospital.

[In this case a large portion of the superior maxillary bone is described as projecting "through the cleft of the lip; not perpendicularly in the natural position of the bone, but turned upwards and forwards, and projecting horizontally, in a direction nearly at right angles with the normal position of the teeth." Therefore,]

Before uniting the fissure in the lip, it was necessary to get rid of or change the position of the projecting piece of the superior maxillary bone. The practice in this hospital has hitherto been to cut off the projecting part; but this plan leaves a gap in front of the bone which is never filled up, and which remains a deformity for the whole of the patient's life, and interferes materially with the power of articulation.

In order to obviate this inconvenience, it was attempted to push the portion of bone back into its proper place, by keeping continual pressure on it by means of a pad. This plan was tried for several weeks, but it failed entirely. I then determined to forcibly break down the piece of bone with a strong pair of forceps, to bend it into the gap, and leave it to become fixed there. This was easily accomplished, the soft parts having been previously divided. A small compress of lint was placed over the part so as to confine the bone in its new position, and kept in its situation by means of adhesive plaster.

No bad symtom whatever followed this operation, and the piece of bone was easily retained in its new place, and in about a fortnight it became firmly fixed there. By this means the gap in the superior maxillary bone was entirely filled up. The ordinary operation for hare-lip was now performed; viz., the edges of the fissure in the lip were pared, and the two even surfaces were brought together in the usual way with hare-lip pins.

In cases of very young children, I recommend you always to try pressure

for some time when the bone is projecting. It may not unfrequently be reduced by that means, and, in proof of this, I could, if it were necessary, adduce many cases.

On no account cut off the projecting piece, for although the highest authorities have recommended that practice, I feel convinced that it is quite unnecessary, and that by so doing you will render the articulation of the patient imperfect for his whole life-time; and, in many instances, much deformity will result from the falling in of the lip, there being no support for it.

Although, indeed, by the removal of the part, you accomplish your object in one operation, that slight advantage should not be considered, when the patient's comfort for life is at stake.

We frequently see persons who have been operated on for hare-lip, with a small V-shaped cleft remaining at the bottom, when the paired edges have not united. This, I imagine, arises from the parts retracting below the lower needle, and not being kept in contact long enough to enable them to unite. I therefore advise you, in order to obviate this, in all simple cases of hare-lip to make both the raw surfaces of a concave shape; and by this means you will leave a sufficient quantity below the lower needle to allow for a certain degree of retraction, without a gap in the margin being left. This mode of proceeding I have followed in the hospital for many years.

There is another plan which I have also sometimes adopted to prevent a notch remaining in the lower margin of the lip. I leave portions of what I slice from the edges of the fissure attached to the inferior angles of the fissure; turn them down with these raw surfaces opposed to each other, and confine them in that situation. By this proceeding, instead of a notch being left, the central portion of the margin of the lip may be made to project. It is many years since I first had recourse to this proceeding.

Sometimes the edges of the fissure are so far apart that it requires great force to bring them together, and in these case they will not readily unite. It is therefore, necessary to separate the parts very freely, and far back on either side; and I have met with cases in which the deficiency of lip has been so great, that there was no possibility of keeping the edges of the fissure sufficiently in contact without making a perpendicular incision on each side of the lip, commencing at the outer side of each of the alæ nasi. By this means you will always be enabled to bring the edges so easily together that they will readily unite. The incision should not be carried through the membrane of the mouth, but merely through the common integument and muscles. It will sometimes suffice to make an incision on one side only. This cut generally heals readily, and little or no mark remains.

With regard to the age at which this operation is best performed, there has been great difference of opinion; but, as far as my experience goes, (and I have operated as early as three weeks and as late as the twenty-first year,) I do not think, in simple cases, it makes much difference. In the more complicated cases, the operation should always be performed at the earliest period.

I should, however, avoid as far as possible, the period between six months and two years, because dentition is then going on. As a general rule, I think that the earlier you operate the better; for the most successful case I ever had was in a child, as stated above, only three weeks old.—*Med. Times, February* 1, 1851, *p.* 111.

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## 70.—OBSERVATIONS ON CLEFT PALATE.

By Wm. Fergusson, Esq., F.R.S.

[Speaking upon the operation for cleft palate, Mr. Fergusson remarks:]

In former days the operation for cleft palate, as practised by Roux and Graëfe, was so unsatisfactory, that some surgeons would not undertake it. I was led by this want of success to investigate the subject with care, and some years ago I brought before the Royal Medico-Chirurgical Society the results of these investigations. By anatomical demonstration, I showed as clearly as could be exhibited, that it was the actions of certain muscular fibres upon the edges of the cleft which prevented the wound from uniting after opera-

tion, as they had a tendency to draw the edges apart. It was suggested to my mind that the division of these fibres would materially contribute to the success of the operation. I satisfied myself, and demonstrated to others, that the levator palati was the muscle which had the chief action upon the flaps in this cleft condition of the palate. When these views were first brought forward by me, it was objected, that the action of the tensor palati was not taken sufficiently into account. Mr. Liston was one of those who thought in this manner. until he saw the preparation which I now have in my possession, and on which I dissected the parts in the cleft condition. There are other surgeons now who entertain the notion, that it is the tensor that exerts the chief power in rendering tense the palate, and that the division of this muscle is necessary. But they have been misled by the *name* which has been given to it; and it is a matter of astonishment to me how it is that they entertain this notion, after they have examined the muscles of the palate in the normal condition, and more especially after having inspected them in the cleft state.

In the natural condition, when you come to look at the bellies of the *tensor* and *levator palati*, they appear to be equally strong, but a mere glance at these muscles in the natural state even is sufficient to show that, in reality, the latter has a much more extensive sphere of action than the former, which from its name may be supposed, by those who have not sufficiently examined into the matter, to act strongly in rendering tense the soft parts; but its action is very limited indeed. I do not object to the nomenclature, for what action it does possess is to render the palate tense, but it is much less visible than is that of lifting by the levator, which, indeed, lifts and draws outwards, and particularly so when there is a fissure in the palate and the flaps are loose. I am perfectly satisfied that it is this muscle chiefly which influenced the results of the operations, and caused failure.

Now, there is no theory about these views; the condition has been clearly demonstrated; and, if you examine my preparation before spoken of, you can see the action of the muscles, and can satisfy yourselves beyond a doubt that it is the levator, and not the tensor palati, which acts so strongly, and which it is necessary to divide in order to complete the operation of staphyloraphy.

With respect to the management of the sutures, it is customary to withdraw them in about forty-eight hours, and it was formerly my habit of doing so;—but it is not improbable that this early removal may have in some way caused failure in the very few cases which have not succeeded with me. Latterly I have left them in longer, and my own experience of a great number of cases tells me to let the stitches alone so long as they seem to be of any use. In this case, as they appeared to be doing no harm, they were not taken out until the tenth day, when perfect union had taken place at all points except where the lowermost had given way.—*Med. Times, Dec.* 21, 1850, *p.* 642.

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## 80.—REMOVAL OF NASAL POLYPI.

Dr. D. McRuer, of Bangor, Maine, has been in the habit, for some years, of employing the following method for the removal of the gelatinous and soft polypi of the nasal passages.

A piece of catgut is passed from the nostrils to the mouth, to which is fastened a piece of soft and dry sponge, corresponding in size, when firmly compressed, to the narrowest part of the nasal passage; it is then gently drawn forwards by the posterior fauces through the nose, and in Dr. McRuer's experience of at least ten cases, it has never failed to bring with it all the morbid growths much more effectually and easily than could possibly be accomplished by the old methods of forceps, ligature, &c.—*Trans. of Amer. Med. Assocn.*—*London Journal of Med. Science, March*, 1851, *p.* 267.

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## 81.—TEALE'S TRUSSES FOR THE RELIEF OF HERNIA.

[The editor of the "Medical Gazette," speaking from cases of his own, makes the following remarks on the trusses suggested by Mr. Teale, surgeon to the Leeds Infirmary, and described in 'Retrospect,' Vol. XXI., page 235.]

Patterns of all kinds of improved trusses have at various times reached us, and we have been repeatedly solicited to give an *d priori* opinion of their value, either from the theory of their construction, or from the casual inspection of a patient who has worn one. Notwithstanding the numerous improved trusses which have been advertised of late years, including the soft pad, the hard pad, the sand pad, the moc-main, the wire truss, and others, we think that most practitioners still consider it a matter of great difficulty to make a selection. The remarks which we are about to make will, we hope, remove this difficulty.

In our journal for Feb. 1, 1850, we inserted a communication from Mr. T. P. Teale, surgeon to the Leeds Infirmary. A truss is there described as manufactured by Mr. Eagland, of Bond Street, Leeds; and engravings are also given illustrating the principle of its construction, and its mode of application to inguinal and femoral herniæ. Specimens were at the time sent to us for inspection; but, conformably to the rule we have uniformly adopted, we did not give any recommendatory notice of these trusses, either from the inspection of them, or from the reports of others. Their alleged superiority over other hernial bandages, therefore, rested entirely on the statements contained in Mr. Teale's paper.

One of the trusses was ordered and applied to a patient in a case of femoral hernia, to which well-constructed trusses of London make had been hitherto applied, but always with the great inconvenience of unequal pressure and the liability to shift, notwithstanding the use of a thigh-strap. In this case *Teale's truss* has been worn continuously for *eleven months* without a thigh-strap. The pad has perfectly maintained its position in all the movements of the body, and the spiral spring connected with it has allowed of as much freedom of motion as is compatible with the wearing of any hernial bandage whatever. During a like period, before this truss was worn, a change of the ordinary truss, or some alteration of the pad, was required at least once in three months. The result of the long wearing of Teale's truss in the case of this patient has been most successful and satisfactory; and we consider it a duty, therefore, to state the fact for the information of our readers.

The construction and mode of applying the truss are so well described by Mr. Teale in the paper before alluded to, that only a few remarks are required in this place.

The pad is a light hollow shell of ivory, adapted in shape to the part on which the pressure is to be applied—a plan eminently required in the femoral space, to which neither oval, round, or flat pads can be so adapted as to preserve their position without a thigh-strap, or some other encumbrance, such as increased strength in the spring, thus causing undue pressure. The spiral spring prevents the pad from moving with the girdle, and thus allows great freedom of motion without risk. We have here the art of the mechanic united to the anatomical science of the surgeon; and we feel bound to state that Mr. Teale has not in any respect overrated the value of this truss.

Our readers are no doubt aware that there is a strong *espirit de corps* among surgical mechanicians. Each metropolitan maker has his favourite truss, with duly endorsed testimonials, &c.; all others are ignored, and we doubt whether a provincial maker has the smallest chance of insinuating a good article into metropolitan practice, owing to the combination of the trade against him. We do not know how the matter stands with Mr. Eagland, of Leeds, but we are informed that there is no one in London who makes his trusses, or who will make them, except probably on the disinterested principle of absorbing all the profit. We have made inquiries of one or two makers, and they have said that they "know nothing about it"—or "it is only Coles's patent truss," or it is an article that "a London surgeon would never think of using," &c. &c. &c. Our readers must be fully aware how a good article may thus be kept from their knowledge—literally burked—by this sort of pooh-poohing. How many medical men apply to a maker without having any precise idea of the kind of truss most worthy of selection, and are therefore easily led to select the favourite of the particular shop!

It is with regret we learn that these trusses cannot be procured in London, but only from the maker, Mr. Thomas Eagland, of Bond Street, Leeds. We

know nothing of Mr. Eagland, excepting through the paper published by Mr. Teale in this journal; but we have great pleasure in giving, without any knowledge on his part, this strong recommendation of his trusses from our actual observation of their efficiency. We have no doubt that a more extended trial by the profession will confirm this opinion of their value.—*Med. Gazette, January* 3, 1851, *p.* 39.

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## 82.—ON INTERNAL STRANGULATION OF THE INTESTINES.

By Henry Hancock, Esq., Surgeon to Charing Cross Hospital.

[Mr. Hancock submits the following cases to the profession, because the post-mortem examinations of these cases so frequently shew the probability of relief from early operation, and he lays great stress upon the great benefit which must arise from all cases of this kind being recorded.

The first case occurred in a gardner, aged fifty-one, who had enjoyed good health previously, with the exception of having had inguinal hernia on the right side, having worn a truss ten years. On the 17th of October, 1850, he strained himself in his abdomen by assisting in raising a tree. The pain from this time gradually subsided, and he felt no more until the 30th of the same month, when he complained of a slight pain in the stomach, which he attributed to his bowels not having been opened for two days: opening medicine was then ordered and the pain was relieved, but on the 2nd of November, his abdomen was found distended and he was in great general pain. An injection of gruel with castor oil and salt was given, which came away accompanied by small pieces of hardened fæces. All means now used to procure a proper evacuation of the bowels proved useless. His symptoms rapidly became worse, and on the afternoon of the 3d he is stated to appear to be sinking. No signs of hernia could be discovered and his pain seemed now located above the umbilicus. The symptoms would lead us to the conclusion that an internal strangulation existed, but what its precise nature was, whether intussusception, band, or otherwise, or its exact situation could not be decided.]

Not the least external appearance of hernia was to be discovered: the whole abdomen was distended, but not very painful to the touch in any part: but about three inches above Poupart's ligament, on the right side, Mr. Brown directed my attention to a spot at which an elastic and firm feeling was communicated to the finger, and on consultation it was decided to operate on that point. I therefore carried an incision, beginning rather more than an inch above the anterior superior spinous process of the ilium, continuing it towards the linea alba. The abdominal layers were carefully divided in the same direction; and upon coming down to the fascia transversalis, it appeared to bulge at the spot mentioned, and when this was divided, a bulging of the peritoneum the size of a walnut was discovered: this was laid open, and a knuckle of congested intestine disclosed. I sought the seat of stricture, but it was so high up I could not reach it until I drew the intestine gently down for about two inches, when Mr. Brown detained it in that situation, and I was enabled to divide the stricture, which was so firm that we could all distinctly hear its division by the knife. The wound was then brought together, and some brandy and water and opium given to the patient, who, however, died very shortly after the operation.

I was not present at the post-mortem examination, which took place twenty-four hours after death: but I am indebted to Mr. Brown for the following particulars. The intestines contained a considerable quantity of fluid, and were so distended that it was thought necessary to puncture them, and more than three quarts of fluid poured out. The intestines were neither inflamed nor congested, excepting for about four inches, which had been constricted, and which was congested. The constricting band had been completely divided, and no other adhesion or band could be discovered in the course of the intestines, which were perfectly free.

[In the second case the patient had been wheeling some heavy barrows of earth, and whilst warm drank a pint of ale rather quickly, upon which he was seized immediately with severe cramping pains in the abdomen. The same

symptoms appeared as in the last case, obstinate constipation, continued vomiting, swelling of the abdomen, and pain referred principally to the umbilicus. If no relief occurred in the symptoms, it was agreed that an operation should be performed; the friends and the patient, however, resolutely opposed this, and three days after the man died from exhaustion. On examination the mischief was found to exist in the right iliac fossa. The appendix vermiformis was turned up, and through the ring thus formed a portion of the ilium had protruded, which had prevented the free passage of the contents of the intestine, though not sufficient to produce strangulation or inflammation.]

The anxiety connected with cases of this description is greatly enhanced by the uncertainty attending the exact seat of obstruction, from whatever cause it may ensue; the symptoms are frequently so deceitful, the history so meagre, and unsatisfactory, that we have but little to guide us in the selection of locality. It has been stated that a pretty correct opinion may be formed as to the point of mischief, by the constant pain referred to that spot; but this theory is opposed by the first case related, as here the pain was confined to the umbilicus and pit of the stomach, whilst the patient denied its existence over or near to the actual seat of constriction, over which he could bear considerable pressure without suffering; and indeed, it was only the particular feeling referred to the touch, upon pretty full pressure, that led us to perform the operation where we did. It might fairly be asked, did not the previous existence of hernia give you some clue to the nature of the mischief, and would not that serve as a guide? It might in some instances; but attention was paid particularly to this point. Not the slightest external swelling or projection at the rings could be detected; whilst the man denied that it had been down, and actually scouted the idea of his sufferings being in any way connected with it; and what still more strongly marks the slight dependence to be placed on the pre-existence of hernia as a guide is, that I was once present at an operation for the relief of internal strangulation; the patient, a woman, had suffered from femoral rupture of the right side for some years, and it was thought that the then existing symptoms might in some measure be connected with it. However, the evidence was so unsatisfactory, that the surgeon determined upon opening the abdomen at the linea alba; it was then discovered that the hernia had nothing at all to do with the matter, but that the obstruction existed on the other side of the abdomen.

Again, the symptoms are so undecided as often to mislead, or, at all events, to increase doubts as to the nature of the mischief. It is an interesting and important fact, that in these cases the constriction shall be sufficient so to interfere with the functions of the part, as sooner or later to destroy life, without at the same time producing any appreciable degree of inflammation; this was the case in both the examples here related, and this accounts for the fact that, although in both instances the abdomen was distended, it was not hard; it could bear pressure; and in both the patients could lie with their legs straight down in bed. Again, the first case proves that we have not always the entire and complete arrest of the passage of the fæces to guide us in our diagnosis, as we find the bowels acted more or less for thirteen days from the occurrence of the strain; and I may here observe, that the passage of fæces must not always be looked upon as an unerring sign of complete freedom from constriction, even in strangulated hernia. A woman was brought into Charing Cross Hospital, having had strangulated femoral hernia of the right side, which had been returned after long-continued pressure by a very intelligent practitioner in the neighbourhood; the constitutional symptoms, however, were unrelieved. I saw her the next morning, and determined that should she not be better in the evening, I would perform an exploring operation, as, upon careful examination, the hernia appeared to have been completely returned; upon visiting her at eight o'clock in the evening, for that purpose, I found her improved, and was told that her bowels had been twice moved, and therefore I concluded all would go on satisfactorily; her bowels were again slightly moved on the following day, but, as she complained of some little uneasiness, a dose of castor oil was ordered. She became rapidly worse, and died from general symptoms of peritonitis in the course of a few hours. The post-mortem showed that the

hernia, which was very small, had been returned "en masse", but that the sac did not contain the whole calibre of the intestine, but only a portion of its side.

*Remarks.* Notwithstanding the fatal termination of these cases, I have ventured to bring them before the notice of the Society, in the hope that they may be of service in directing attention to the propriety of interfering surgically at a more early period than what usually obtains, and of abstaining from the indiscriminate employment of purgative medicines, which had better be discontinued when sickness sets in, as they materially increase the patient's sufferings, diminish his strength, and lessen the probability of the operation proving successful. And I would again venture to advert to the fact, that patients in these internal constrictions are frequently destroyed by irritation and impeded function, and not by inflammation; that consequently the symptoms are more negative than positive: positive, for the most part, as regards sickness, constipation, and prostration; but negative as regards the swelling, and character of swelling, of the abdomen; the pain; and condition of the pulse, until at an advanced period. And, indeed, from the various cases which I have seen, but which the limits of this paper will not permit me to enter fully upon, I am inclined to believe that, in cases of constriction within the abdomen, the symptoms are seldom so acute and decided as either in strangulated hernia, enteritis, peritonitis, or tuphlo-enteritis.—*London Journal of Medicine, March*, 1851, *p.* 246.

In the report of the discussion on Mr. Hancock's cases of Internal Strangulation, an error was made in the part relating to Mr. GAY's observations, which we are desirous of correcting.

The small intestine was found strangulated on the right side, at least twenty-five inches from its termination in the cœcum, by a ring formed in front by the veriform appendix, and behind by a strong adventitious band: the anterior part of the ring thus constituted had become adherent to the bowel.

*The bowel was simply withdrawn; the constricting tissues were not divided*, as stated in the report. The fœcal accumulation was seen to flow onwards into the lately collapsed and empty gut, and the patient lived 23 hours after the operation.

Mr. Gay believed that the fatal termination which had almost invariably followed operations for internal strangulation, was due, not to the nature of the operation, but to the delay in resorting to it.—*Med. Gazette. Feb.* 7, 1851, *p.* 248.

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## 83.—HERNIA—OPERATIONS WITHOUT OPENING THE SAC.

[It may appear somewhat surprising that upon such an apparently simple subject so much controversy, debated at different times, has arisen. The reason of this is, however, that no two cases are found exactly alike, and the surgeon consequently finds that he is compelled to modify his mode of operation and his subsequent plan of treatment according to the singularity or gravity of the different circumstances of the case.]

The point which has been of late, and is now mostly under discussion, is as to the propriety and expediency of performing the operation for strangulated hernia without laying open the sac: other matters connected with the treatment of this affection—such as operating at an early period after strangulation, not using too prolonged taxis, and refraining from the employment of powerful aperients too early after the stricture upon the gut has been relieved—have been satisfactorily settled in the minds of all judicious surgeons; but the one point under consideration is that just mentioned, and it is likely to agitate the minds of practitioners for some time yet, at all events until a larger mass of well-recorded cases of hernia treated by the two separate methods of operating with and without opening the peritoneal cavity shall be brought home to the profession. It must be confessed by all those who have paid any particular attention to this very important subject, that the data are not yet sufficient to justify the surgeon in coming to anything like a correct conclusion as to which is the safest and best mode of operating generally;

nevertheless, the researches of Key, Luke, Gay, and Hancock, have contributed much to enlighten the profession on this matter, and the minds of surgeons are thus imbued with the necessity of considering every case of hernia with extreme care before they determine upon the manner in which such and such a case should be treated. The feeling is gaining ground that the operation without opening the sac is applicable to very many cases of strangulated hernia where a few years ago the peritoneum would have been opened without the least consideration, and supposedly as a matter of necessity; that also the danger of the proceeding is much lessened if so delicate and easily inflamed a structure as the peritoneum is not meddled with. Experience has already amply shown the truth of this; but, on the other hand, it cannot be denied that there are many good surgeons who look upon this mode of operating not only with great suspicion, but who consider it to be both unsatisfactory and more dangerous than when the sac is opened, its contents brought into view, and the condition of the parts well ascertained before they are returned into the abdomen. Those who are advocates of the former method urge as arguments in its favour the great danger of peritonitis where the membrane is cut into and the intestine itself is rudely handled—in fact, the circumstance that in almost every case which is fatal after the ordinary operation, a greater or less amount of inflammation of the peritoneum and its consequences is found, and hence the immunity which obtains when a simple incision is made through the overlying textures. Those who oppose this plan urge—and justly too—that it is not applicable to a great number of cases, and that there must always be an extreme difficulty in selecting those to which it really is applicable; moreover, that the peritoneum is not so liable to be inflamed by a simple incision into it as is imagined by some, and that it is impossible to tell at the time of operation whether or not the stricture be fairly relieved, and whether the intestine itself be in a fit state or not to be returned into the belly. Such, then, is the position which this question at present assumes, and is likely to maintain, until the experience of a large number of cases has been fully brought before the profession.

Before proceeding to relate two instances of strangulated hernia where the operation has been successfully performed without opening the sac, we will allude to the report of a case which we inserted from this hospital a few weeks ago. In this instance it will be remembered that the patient was an old man, in whom strangulation of the intestine had existed for less than twenty-four hours, and everything appeared to be favorable for the operation without opening the sac; and yet, on post-mortem examination, a considerable portion of the intestine was found to be in a condition quite unfit to be returned, although the stricture had been effectually relieved by cutting it outside the peritoneum. We at that time made the remark that this very case illustrated the difficulty which must necessarily exist in arriving at a correct conclusion as to the state of the parts inside the hernial sac, and was *per se* an instance to show the danger and inexpediency of returning a portion of intestine which has been constricted even for a short period without first ascertaining its condition. We have now, on the contrary, to relate two instances where the same kind of operation has admirably succeeded, and which thereby tells as arguments in favour of operating without opening the sac, if possible.

Mary Ross, aged forty-eight, married, was admitted into King's College Hospital with a strangulated femoral hernia, on Tuesday, November 26th. She stated that on Monday evening, at eight P. M., whilst sitting before the fire, she was suddenly seized with a severe pain in the lower part of her belly. She at once sent for a medical man, who gave her an emetic which acted violently, and increased the pain under which she was suffering. About eleven o'clock of the morning she was admitted, she first herself noticed a tumour on the right groin, which was very tender to the touch. She had never observed a swelling there before. At two P. M., she was sent into the hospital, *no attempt whatever having been made to return the hernia before admission.* Mr. Fergusson pronounced the tumour to be a femoral hernia: the patient was at once placed under the influence of chloroform, and a careful attempt was

made to return the swelling by the taxis; but Mr. Fergusson finding that it did not yield in any way, determined to operate without further delay, making a very short incision over the hernial tumour, he dissected through the separate tissues, and carried the knife inwards, and divided Gimbernat's ligament, outside the sac: the contents were at once returned into the belly; little blood was lost; the edges of the wound were united by sutures; a compress and bandage were applied.

27th. This patient suffers no pain; has slept well the preceding night, but the bowels have not been opened since the operation.

28th. Bowels have been opened by means of an enema this morning. The patient feels comfortable.

Dec. 3rd.—Stitches have been taken out of the wound, and this is dressed with adhesive straps.

Discharged on the 7th.

Lydia Boothby, æt. forty-six, married, and mother of eleven children, has had a crural rupture on the right side for the last six years, and has worn a truss for the last twelve months. On the night of December 23d. at ten, she was seized with vomiting and a dragging pain in the stomach, whereupon she attempted to return the tumour with the help of her husband, but found she was unable to do so. These efforts at reduction were continued all night; and as they were unsuccessful, she applied and was admitted into the hospital next day, December 24th. She had vomited fæcal matter before she came in. She had no vomiting when admitted, but complained of a severe dragging pain at the stomach, and shooting pain over the abdomen. There was a tumour, the size of an egg, in the left groin, turning up over Poupart's ligament: it was hard, and felt nodulated at the upper part, but was smooth and fluctuated at the lower. Mr. Fergusson saw the patient, and, finding that he was unable to return the hernia, proceeded to the operation. He first made a very limited incision just over the neck of the tumour, and divided the separate tissues over the sac; he then passed the knife upwards and inwards, and cut the Gimbernat's ligament, and was then enabled to pass the contents of the sac into the belly without opening the sac. It was necessary, however, after dividing the ligament, to cut some fibres between that tissue and the sac; the rupture after this was returned with the greatest facility.

On the same evening this patient found herself much relieved; there was no pain, no tenderness, nor sickness.

On the next day her bowels were freely opened, and the only thing she complained of was a little fever, which required some saline medicine. The wound soon put on a healthy appearance, and she rapidly recovered.

Both these cases are interesting, inasmuch as the same operation was put in force in either, and that, too, with the greatest success, although the two cases were not by any means alike. The comparatively simple and harmless operation without opening the sac was performed, and both patients recovered without a single bad symptom. Both cases illustrate the fact that there are certain instances of strangulated hernia to which this peculiar operation is decidedly applicable; and they teach us what are the circumstances which will lead the surgeon to judge that he is dealing with a fit case for such a mode of procedure. In the first patient the conditions were just those which are considered to be the most favourable for attempting the operation without cutting into the peritoneum. The woman had never suffered from hernia; in fact, it was a quite recent descent of bowel; the parts had not been suffered to remain long down, and, moreover, it was a femoral hernia, which is probably that kind of hernia in which the operation of not opening the sac is most likely to succeed frequently. The anticipations of the surgeon that in such a case the operation might be completed without difficulty were verified. In the second case the same conditions did not obtain; for here the hernia was not recent, but was of six years' standing, and for twelve months the patient had worn a truss; and it might with propriety be expected that some changes would have been brought about in the sac which would oppose a successful attempt at reducing the hernia without an exposure of the cavity. Nevertheless, there was an equal amount of facility in either case in completing the operation. There was

also this difference in the two cases—in the one it has been seen that no attempt whatever had been made to return the hernia, either by the patient herself, or by a medical practitioner; in the second instance, both forcible and prolonged attempts were made by the patient and her husband to push the tumour back.

The circumstances in each case were therefore different, and certainly much more unfavourable in the latter case. Still this rude handling of the parts had not appeared to have produced any mischief. A great point in the success of both cases consisted, doubtlessly, in early recourse to operation,—a measure which should always be adopted whenever it is considered that the employment of the knife is necessary. It must not, however, be considered that in all cases like these mentioned, and more especially the first, the operation of not opening the sac will invariably succeed or can be accomplished; nor is it to be supposed that the intestine must necessarily be in a fit condition to be returned, because strangulation has existed only for a few hours, and because those symptoms which not unfrequently indicate a gangrenous condition of the intestine are not at all perceptible. The case of the man first alluded to shows the impossibility of deciding this question; for, although in this instance strangulation had not existed for twenty-four hours, death rapidly ensued after operation, and the intestine was found in a very disorganized condition; and it is often quite impossible to judge, from the absence of symptoms, as to the comparatively healthy state of the contents of a hernial sac. A few days ago we were present at an operation in a remarkable case of strangulated femoral hernia in a very aged person, where there were not the slightest symptoms to indicate that the intestine was in anything but a healthy condition. The operation without opening the sac was performed. The stricture was fully relieved, but the patient died; and on post-mortem examination a considerable portion of intestine was found to be in a semi-gangrenous condition. This uncertainty as to the state of the intestine must then be looked upon as one of the great impediments to, and difficulties in connection with, the adoption of this particular plan of operating. Still it must be hoped that a careful observance of signs and symptoms, and the experience of a greater number of cases than have hitherto been brought forward, may be able to enlighten the surgeon on this serious point, and enable him to avoid the dangers which must necessarily arise if he adopts too hastily or too generally either plan of operating.

Mr. Fergusson has lately adopted a mode of operating by a very small external incision through the skin, just over the neck of the tumour. It was formerly his custom to recommend and practise much freer incisions, of various shapes, over the surface of the tumour; but he now proceeds in a manner somewhat like that recommended by Mr. Gay in his very beautiful work on Femoral Hernia: by means of this incision he is enabled to get easily at the Gimbernat's ligament, which it is generally necessary to divide. Should, however, a large incision be found necessary, it is very easy to extend it over the tumour. Mr. Gay practises his incision, which is even more limited than that of Mr. Fergusson, by the side of the neck of the hernia, and does not interfere with the tumour at all if he can possibly effect his object without it. Mr. Fergusson, in both the cases narrated, made a small cut just over the neck of the hernia, but interfered little with the main portion of it. The advantage is that so small a wound very soon heals up.—*Med. Gazette, January* 24, 1851, *p.* 163.

[In a case related by Dr. WHITTLE, an infant, exactly five weeks old, was supposed to be suffering from strangulated hernia. The symptoms had persisted for sixteen hours: the tumour had appeared suddenly, no fluid could be detected in it; the testicle could be felt at the bottom of the swelling. The taxis having been employed, and having failed, an operation was decided upon.]

Chloroform was administered by putting a few drops on a piece of lint, and holding it before the infant's mouth for two or three minutes. The skin and fascia being carefully divided, the tunica vaginalis was exposed, with a stricture tightly embracing its neck at the abdominal ring: this was divided with a probe-pointed bistoury, after which a slight effort was sufficient to reduce the intestine, which was returned into the abdomen without opening either the tunica vaginalis or the hernial sac. The little patient was relieved for a

time, the vomiting ceasing, but the bowels were never opened; and after a few hours the symptoms of strangulation returned, and the child died within twenty-four hours after the operation.

The post mortem examination revealed the cause of the fatal result, which was not strangulation of the intestine by the neck of the sac: on the contrary, the sac merely consisted of a fold of peritoneum which had been carried down the inguinal canal before the knuckle of intestine which had got caught in the ring: the peritoneum about the ring was vascular and deeply coloured, and could be easily pushed into the ring by the pressure of the finger; the strangulated knuckle of intestine lay loose in the cavity of the abdomen, still held tightly in the contracted knuckle-form (which it had acquired in the ring) by little bands of recently deposited soft lymph, stretching across the bent intestine, and effectually preventing its yielding into a longitudinal direction, so as to permit the passage of the fæces.

Now, I believe this case might have ended more happily, had the sac been opened, and these slight adhesions been broken up by drawing down the intestine a little before it was returned into the cavity of the abdomen. The objection generally urged to operating without opening the sac is, that the neck of the sac is itself very frequently the seat of the stricture; but in this case, the neck of the sac being quite free from stricture, we have a cause of permanent occlusion of the bowel by the deposit of adhesive lymph upon the folds of strangulated intestine within the sac.

The features presented by this case appear to me rather to weigh against the proposal to return the hernia without opening the sac,—at least in the case of infants, in whom the effects of inflammation are developed with so much more rapidity than they are in adults. If this question can only be decided by comparing the results of cases, whether they end favourably or not, this contribution from my limited experience will not be without its value.—*Med. Gazette, February 7*, 1851, *p.* 229.

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## 84.—CASE OF FISTULA IN ANO.

By Professor Syme.

[Speaking of the treatment of this affection, Mr. Syme says:—]

I introduce my left forefinger into the anus, and a probe into the sinus at the small orifice, which is found on the summit of a small warty-looking eminence, about two inches from the orifice of the bowel. Directing the probe towards my finger, I feel the internal aperture very little beyond the junction of the skin and mucous membrane. Pushing on the probe, I bring its point outwards into view, and holding it there, with one stroke of the knife divide the textures which it includes, so as to set it free, and effectually accomplish the object of the operation, which is to cut that part of the septum lying between the external and internal openings of the fistula. A piece of lint is then placed in the wound, and the patient sent to bed, requiring no further dressing or care, except what is requisite for the removal of impurities, and with the prospect of being quite well in a few days.

[For the proper limitation of the incision in this case, we are indebted to M. Ribes. In reference to this, Professor Syme remarks, in his treatise on Diseases of the Rectum, published in 1838:—]

It had been noticed by Sabatier and other good surgeons, that the opening of a complete fistula was generally seated near the orifice of the anus. But in 1820, M. Ribes had the merit of showing that it was always so situated, never exceeding the distance of an inch and a quarter, and often lying considerably nearer the skin. The importance of this observation will appear when it is recollected that the operation requires division of the parts intervening between the two openings of the fistula; since, unless the internal one be sought for in the proper place, it may escape detection, and thus not only occasion an unnecessarily high section of the septum, but, from not being included in the incision, lead to a continuance of the disease. When the internal opening is sought for at the summit of the sinus, it cannot be found, so that the fistula is apt to be supposed incomplete or blind external; and M. Ribes,

avoiding this error, ascertained that an internal aperture existed much more frequently than had formerly been supposed. He went, indeed, into the opposite extreme, contending that it was present in every case requiring the operation, and accounting for its constancy by attributing the origin of the disease to ulceration of the mucous coat of the gut. But I have already stated that the abscess which gives rise to fistula is very generally discharged outwards in the first instance: and every attentive practitioner must have remarked that an internal orifice is very seldom met with in recently formed fistulas; which facts are quite inconsistent with this theory of M. Ribes.

I have ascertained farther, that, in those cases where an internal aperture does not exist, the mucous membrane at the part in which it would be situated if present, is not only denuded, but rendered so thin that the perception of a probe through it is hardly less distinct than if it had entered the rectum; and that, if the incision extends to this point, the cure will be no less certain than if an opening into the gut had existed.

In regard to the importance of the principles thus established, I may, in the first place, remark, that limiting the incision within the narrow bounds that have now been mentioned, lessens not only the difficulty of its performance, and the suffering of the patient, but also the risk of hemorrhage, and the trouble of after treatment; since instead of having to keep separate the edges of a deep and not easily accessible wound, the surgeon has merely to prevent adhesion between the lips of a superficial cut. But the operation, while thus simplified in its performance, is also rendered more certain in its effect, since in cases of complete fistula the most extensive incisions will fail to afford permanent relief, unless they include the internal opening. I have very frequently operated on complete fistulas that had been looked upon as blind external, from the internal orifices having escaped detection through unacquaintance with its position; and the repetition of operations for the disease, which are so frequently heard of in practice, are no doubt referable to this mistake.

In the reports of surgical cases which I have published from time to time since the year 1829, and also in the systematic work on Surgery, of which the first edition appeared in 1831, I have endeavoured to explain and impress these principles which have been uniformly acted on in my own practice. They are still, however, far from being generally adopted, and many writers of the highest authority continue to inculcate the practice of Mr. Pott. Sir A. Cooper says, "If the fistula does not open into the intestine, you must pass the instrument (a bistoury) up the sinus till it reaches the extremity."—"A very copious hemorrhage generally follows the division of the septum," &c.* Mr. Copeland says, "In this operation though there are no vessels of very considerable size in danger of being wounded, yet, when the sinus extends far up the side of the gut, a hemorrhage now and then takes place, either at the time of the operation, but more usually a few hours after it, which, if it be not important from the magnitude of the divided artery, becomes often so from the difficulty, perhaps impossibility, of securing it by a needle and ligature."—"I will venture to say, that it (hemorrhage) has occurred to almost every surgeon who is in the habit of performing the operation."—"After many unsuccessful attempts to secure a bleeding vessel under such circumstances, I once accomplished it by introducing a blunt gorget into the rectum; and, by keeping the gut thus dilated, I was enabled to see the orifice of the bleeding artery and to secure it."† Mr. Liston says, "Some contend that fistulæ are always complete, that they commence from within, and that the internal opening is always at one particular point; but such, according to my experience, is very far from being the case."—"Having reached the extreme depth of the canal, the direction of the instrument's point is changed, so as to apply its cutting surface to the coats of the bowel at that part."‡

In the second edition of my treatise I added the following passage:—

"Having so long contended in favour of the almost constant presence and

* "Surgical Lectures, p. 425. 1837."
† "On Diseases of the Rectum and Anus, pp. 159-161. 3rd edition."
‡ "Elements of Surgery, vol. iii. pp. 70-82.

fixed position of the internal orifice, I am happy to observe that Sir B. Brodie now advocates the same doctrine.

"The first thing to be done is to find the inner opening. I do not say that you will always succeed in finding it,—certainly not the first time, but you will rarely fail if you look for it in the right place. Formerly, I often failed, and for this reason,—I did not know where to look for it. I used to think that it was to be found in the upper part of the sinus, but it is never found there if the sinus runs high up. You must search for it immediately above the sphincter muscle."*

Having thus long and earnestly contended for the proper treatment of fistula, founded upon its true pathology, and endeavoured to bestow the credit of establishing this where it was justly due, I read yesterday, with what feelings of surprise you may imagine, the following statement of a clinical lecture, delivered by Dr. Hughes, surgeon to the Jervis' Street Hospital, and published in the 'Dublin Medical Press' of 20th Nov. last.

"Till a comparatively recent date, writers who were received as the best authorities on the subject of fistula in ano, have recorded their opinion, that the external blind fistula was the most common form of the disease; however, one of the highest modern pathologists—I mean Sir B. Brodie—has, from extensive investigations on both the living and dead, arrived at the conclusion, that the complete fistula in ano is the most frequent form of the disease; indeed, Sir Benjamin Brodie is so impressed with the fact, that he states that there are very few cases, if any, in which the fistula does not communicate with the gut internally; and he insists, that if the surgeon will only look for the internal opening in the proper place, that he shall surely find it; and he asserts that although the action of the sphincter and levator ani muscle may interfere with the healing in of an abscess in connection with the rectum, yet he principally ascribes its non-healing to the constant presence of this internal opening, and to the continued irritation kept up by the infiltration of the contents of the bowel, whether feculent or gaseous, into the cavity of the abscess.

"When this announcement was first made, it startled the profession not a little, emanating, as it did, from one of the highest authorities in Europe, and which, if established, would throw considerable light, not only on the pathology, but also on the treatment of fistula in ano; however, there are many excellent surgeons who still question the invariable presence of the internal opening in fistula in ano. The subject is one of deep interest, and in my mind can only be settled by an extensive series of post-mortem examinations. I, therefore, wish to speak cautiously on the subject; still I hope I may, without committing myself, say, that I suspect cases have been considered as blind external ones which were really of the complete form, and I am convinced that such mistakes can satisfactorily account for the occasional failure of operations for fistula in ano. I, therefore, am of opinion, that the profession is much indebted to Sir B. Brodie for having directed their attention to the frequency of the internal opening in fistula in ano."—*Monthly Journal of Med. Science, February*, 1851, *p.* 174.

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## 85.—REMARKS ON FISTULA IN ANO.

By Bransby B. Cooper, Esq., F.R.S.

[In a case upon which the following remarks were made, the fistula did not appear to perforate the rectum. Although Mr. Cooper thought this might be correct, yet, that if so, it was an extremely rare occurrence, and that it was pathologically probable that there was a communication, although it was not discoverable with the probe; for he says:]

In nearly every instance does the disease begin in the rectum and proceed downwards, arising from some disordered state of the viscus, or perhaps of the viscera above; and when an abscess has once formed in connexion with the rectum, the parts around are kept in a constant state of irritation from the escape of gas or fæces. I repeat, it is an extremely rare circumstance for an

* "Lancet, 26th January, 1844, p. 533."

abscess to arise externally to the bowel, and ulcerate through it, although I do not deny that this may, and does sometimes happen. Surgeons usually in these cases of fistula in ano, search about with a probe, and endeavour to find the communication with the rectum, or to ascertain the extent of the fissure To me, however, this is a matter of very little importance and consideration; for, whether the fistula does or does not communicate with the gut, or whatever its extent, the treatment or course to be adopted is the same, namely, to divide the fibres of the sphincter ani muscle, and thus allow the parts, which were previously under the constant influence of muscular action, to remain as much at rest as possible.

The operation itself is a very simple one, and only requires the exercise of a little moderate care and attention. I usually place the patient on his hands and knees in bed, or else kneeling across the back of a chair, so as to obtain a full view and exposure of the affected part; then passing a director through the fistula as far as the bowel, and along this a probe-pointed bistoury, I withdraw the director, and take hold of the bistoury with either the right or the left hand, according to the side of the anus on which I am operating; next, introducing the index finger of the other hand into the rectum, and feeling for the point of the bistoury, I press the two together, and in that position withdraw them, cutting through rectum, sphincter, and all the intermediate parts. It is not requisite or necessary to pass the bistoury to the extreme extent of the fistula, on the contrary, the division of the sphincter fibres is sufficient to promote the healing of the whole fistula And, again, whatever number of fistulæ there may be, the operation on one will effect the cure of all. I have just one or two more remarks to make, in completing this subject, which are of much importance, in insuring a successful result from the operation. The division of the sphincter should be in a direction straight across it, and not too much towards the os coccygis, or some of the fibres will remain undivided and the operation incomplete. And in the female, the division must not be directed towards the vagina, or the opposed surfaces of the wound will be constantly subjected to the action of the muscular apparatus of this organ, and will not unite or heal. Should you ever meet with a fistula between the vagina and the rectum, I, by all means recommend you to leave it alone; for, if you operate on it, the wound you occasion will never heal, and your patient for ever afterwards be unable to retain her fæces. If you like, however, to make an incision, and divide the sphincter ani away from the fistula, I think you may, in some cases, be successful in effecting a cure, by removing the exciting influence of this muscle. At all events it is worth a trial.—*Medical Times, Jan.* 18, 1851, *p.* 57.

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### 86.—NON-UNION AFTER OPERATION FOR FISTULA IN ANO, OCCURRING PRIOR TO ADMISSION INTO GUY'S HOSPITAL.

[In this case the patient had suffered from fistula for six months past; is a stout, flabby, and somewhat unhealthy looking young man, but states having enjoyed good health hitherto. Six months since an abscess appeared in the perineum, which gradually increased to the size of an egg, when it was opened and three ounces of exceedingly offensive pus was evacuated. The fistulous opening never properly healed; neither have the margins of the wound united.]

On examining the part, the anterior portion of the sphincter and rectum had been divided in a direction directly forwards towards the perineum, and still remains so, but little, if any, union having taken place between the divided edges. There are also two fistulous sinuses,—one extending on either side of, and nearly around, the anus; whilst the other passes for some distance towards the rectum, where the probe can be distinctly felt through the mucous membrane.—He was ordered castor-oil mixture twice a day, which acted freely on the bowels

Mr. Hilton examined the rectum with his speculum ani, but was unable to discover any evidence of a communication between the external opening and the rectum, either by means of the probe, or by injecting water with a syringe through the external aperture—most, if not all, of which returned by the same

orifice. On December 10th the operation was performed by introducing a grooved director, and first dividing, by means of the sharp-pointed bistoury, that part of the fistula running up by the side of, though, as far as could be ascertained, not communicating with, the rectum; after which, the fistulous canal running around the anus under the integument was treated in a similar manner. Oiled lint was now placed between the edges of the wound, and the patient was ordered to keep perfectly quiet in the recumbent posture.

11th.—He felt very comfortable; his bowels had not been moved, and there was no evidence of any constitutional disturbance.

12th.—The bowels have been moved, but without causing him much pain.

14th.—The wound discharges but little, is granulating slowly, and seems disposed to heal up from the bottom.—Ordered potassæ bicarbonatis, ʒ ss.; infusi cascarillæ, ℥j. ter die. Nitric acid lotion to be applied to the granulating surface in order to stimulate it slightly.

16th.—There is not so much discharge as previously, and the fistula is filling up as favourably as can be expected.

24th.—The divided parts are decidedly uniting, and he expresses himself as feeling much better. From this time he continued daily improving up to Dec. 30th, when his furlough being expired, he was compelled to leave the hospital to return to his regiment. The wound at this date had healed considerably, and there seemed every probability of the operation being attended with success.

In this case you will observe that the fistula was situated in front of the anus, and between it and the scrotum. The patient had undergone one operation for laying open the canal prior to his admission, the result of which was unfortunate. no union having followed,—an event happily not of very frequent occurrence. The termination, however, suggests to us one important fact—viz., never to perform the operation without having previously ascertained whether there are any other co-existing diseases which may interfere with its success; and on investigating the different causes of these cases of non-union, they may be divided into the local and constitutional. On the present occasion, we shall only advert to the local; but do not forget the non-union after the operation for fistula in ano is frequently associated with disease of the hepatic and pulmonary organs. Of the local causes, a communication with the urethra may be mentioned amongst one of the first. This is a complication of the greatest importance to investigate and make out prior to performing an operation. Many cases have come under my notice in which the operation for fistula in ano has failed for want of this precaution being duly attended to. One case came under my care in which a communication of this sort existed,—the result of an ulceration in the urethra behind a stricture: the complication had not been suspected, and the perinæum had been divided into the rectum, so as to lay open the fistulous track, the consequence of which was that no union followed, and the patient could never retain his fæces after; but by passing the catheter, and keeping one constantly in his bladder, the opening in the urethra was closed, and the patient so far recovered.

Another case of this kind came under my care last May, where the fistulous opening communicated both with the urethra and the rectum: having made this out, I declined performing any operation, but recommended he should keep on his back, and that a catheter should be kept constantly in the bladder, so that urine should never be passed excepting through the catheter. My patient persevered in this plan of treatment, but was unable to keep the catheter in his bladder, in consequence of the irritation caused by it. The frequent introduction of the instrument has been attended with decided benefit; notwithstanding, there is every reason to believe that he is the subject of phthisis,—yet, on hearing from him a few days since, he says he is much better in every respect, although a few drops of urine occasionally escape through the opening in the perinæum, which is of a pin-hole size, and some urine still passes into the rectum at each period of micturition.

The non-union in the case of the soldier did not depend either on any communication with the urethra or on any pulmonic complication, as indicated by the absence of all symptoms of these organs being affected, when taken in

conjunction with the patient's previous history; whilst the healthy state of his chest was ascertained by a stethoscopic examination. The non-union, however, appears probably to have been the result of a too extensive division of the perinæum into the rectum at the first operation. Such an extensive division of soft parts it is important if possible to avoid, in order to prevent an unpleasant termination, like that in the present case. If the fistula extends high up into the rectum—say for instance, three inches—I would not advise you to divide the entire extent of the canal, but to operate on a smaller scale, —that is to say, after passing a director along the sinus, to divide that portion of the canal lying external to the curve of the sphincter muscle: after which the remainder of the track will most probably heal up of its own accord; but if, on the other hand, the fistula does not extend more than an inch and a half up the rectum, the whole extent may be divided without any fear of such an untoward result. This extensive division is not generally considered a cause of failure in these operations. I am fully persuaded, however, that it occasionally is so; and it seems to be a very probable explanation of the soldier's case,—an opinion which is confirmed by the present condition of the parts. Another case of non-union is when several small fistulæ communicate with each other. In the present case there were two, both of which were laid open during the last operation; although, when these are quite superficial, the injunction of a solution of nitrate of silver, black wash, or sulphate of zinc, will often be found sufficient to heal them. I am unable to complete the case, as the final result is unknown. It is, however, one of great practical interest, from suggesting some important considerations in reference to the operation, tending to show us one cause of failure, as well as how the treatment must be modified by existing circumstances; especially by the length of the fistula, and its depth in the soft parts about the rectum.

[The second case of fistula in ano occurred in a patient of a robust and plethoric habit. He was a shoemaker of temperate habits, and had enjoyed general good health.]

About fifteen years since, he became the subject of fistula in ano, for which he underwent an operation; and the fistula is said to have healed up, but there is no evidence of a cicatrix. From that time he has experienced an occasional aching pain around the anus, especially after going to stool. About three months since he first noticed a swelling in what he considered to be the position of the former fistula. This gradually increased in size and gave rise to some amount of constitutional disturbance until five weeks since, when it opened of its own accord, and discharged an exceedingly offensive purulent matter; since which it has remained open, and continued discharging up to the period of admission; but, so far as he can judge neither gas nor feculent matter have ever passed through the fistula.

Ten days ago, another swelling formed on the opposite buttock, which burst about four or five days after, discharged very freely at the time, and then gradually it healed up. On examination, there is a fistulous opening on the left side of the anus, distant about one inch from it, along which a probe can be passed for some distance, though not into the rectum; and after repeated attempts it was found impossible to ascertain, by means of the probe, whether the fistula did or did not communicate with the rectum: this difficulty as regards diagnosis was overcome by injecting water somewhat forcibly into the external opening, the speculum ani having been previously introduced up the rectum, when, by carefully examining the walls of the rectum through the deficient portion of the instrument as it was turned round, water was at length observed to pass into the posterior part of the rectum, through a very small aperture, which by the aid of the speculum, was rendered distinctly visible. The patient is quite free from inconvenience during defæcation, but complains of an aching pain around the anus afterwards, as also of general weakness and pains in his loins. His bowels are habitually constipated. Appetite very good; sleeps well; there is no evidence of ptthisis or any other disease.

20th. He was ordered to keep in bed in the recumbent posture, and to take castor oil mixture twice a-day.

26th. The fistula still discharges freely. His bowels are kept open every

day.—Ordered a full dose of castor oil to-morrow morning, so as to clear out the bowels effectually prior to the operation.

27th. The patient having been drawn to the edge of the bed, where he was placed upon his back, with his pelvis well raised, Mr. Hilton proceeded to lay open the fistula into the rectum, as follows:—The speculum ani was first introduced up the rectum, with the slide opposite to the internal opening; a grooved director was then passed through the external opening as far as it would proceed along the fistula, and a grooved probe, bent at an acute angle for the purpose, was introduced into the internal opening by the aid of the speculum, and directed downwards and outwards until the two instruments were close to each other. By means of a sharp-pointed bistoury, which was passed along the groove in the director, the soft parts, including the sphincter muscle, were divided, and the lower part of the fistula was laid open: the extremities of the two probes were thus exposed, when the upper portion of the fistula was observed to extend off in an angular manner, though perfectly continuous with the lower half of the fistulous canal. The upper portion was then divided with the bistoury from above to below, thus completing the division of all the soft parts between the two outlets. The upper part of the fistula formed a very narrow canal, the walls of which were distinctly visible after the operation by the aid of the speculum, and yielded a sensation of thickness and hardness to the touch, as if of a cartilaginous character. A piece of lint was placed between the edges of the wound, and a cold sponge was applied externally: there was no important hemorrhage after the operation. The patient lay down in his bed, and was ordered to keep perfectly quiet.

28th. The patient has slept well during the night, and feels very comfortable.

30th. He was suffering considerable febrile disturbance: tongue furred, hot skin, quick pulse, and felt very thirsty. There was no evidence of any shivering, and the wound looked tolerably healthy. On the right side of the anus there is a red spot, as if a small abscess was forming, but at present there is no evidence of suppuration.—He was ordered poultice to the part, to keep in the recumbent position, and take a dose of castor oil. These symptoms, however, quickly passed off, and all trace of the superficial abscess disappeared. The wound healed up by granulations of a healthy character. He continued to do well in every other respect; so that, on January 11th, he was enabled to leave the hospital cured.

This patient was operated on for fistula about fifteen years ago, and states that he has always been subject to occasional pain and uneasiness about the rectum from that time. Judging from this, as well as from the thickened condition of the walls in the upper portion of the fistulous sinus,—evidently showing that that part was not of recent date,—I am disposed to think that the fistula was not completely divided at the first operation; thus accounting for his uncomfortable sensations in the neighborhood of the rectum since that time. When the abscess was opened, it has been already stated that the discharge was of a very offensive character; and I would wish you to bear in mind that this is generally the case when an abscess forms in any situation near the intestinal walls. This highly offensive character of the pus, so commonly observed in these cases, is no proof whatever that the abscess communicates with the rectum, even although it should have a decidedly feculent smell, or if gas should escape when an opening is made into the abscess externally. Pathological anatomy teaches us beyond all doubt that it may acquire this peculiar odour from its situation alone, especially when near to the cæcum or colon, or rectum: this fact I have proved by frequent dissections made for the special purpose of ascertaining whether any communication existed between the abscess and the intestinal canal. It appears to depend on the imbibition, or rather on the passage of those gases common to the intestines, through the delicate wall of the gut, according to the law of endosmose and exosmose: the gas being once in the abscess, acts upon the pus globules, and thus engenders a continuous process of decomposition, which ultimately leads to a highly fetid condition of the pus, and the formation of more gases. The knowledge that an abscess does not necessarily communicate with the intestines, even although the fœtor of its contents would seem to indicate it, is a fact which may frequently prove

a source of congratulation to yourself, as well as of satisfaction to your patient, especially when the abscess is in the lumbar or iliac regions.

The indications for treatment in these cases are to keep the patient in the recumbent posture for two or three days prior to the operation, the chief object being to get the parts in a more healthy condition, as not unfrequently, either from the irritation caused by standing or walking, the parts become hot, swollen, and somewhat inflamed: and if the operation were performed at once, without a due consideration of these circumstances, the chances of success would be very much diminished.

This I am particularly anxious to impress upon your minds, as you will find it contribute materially to your success in practice. Oleaginous purgatives should be exhibited for two or three days previously, and a full dose of castor oil on the morning of the intended operation, so as thoroughly to evacuate the bowels, and thus to do away with the necessity of an evacuation for several days afterwards. The next thing to be done is to divide the sphincter and soft parts into the rectum, and so to lay open the fistulous track: whether this should be done through its entire extent would, as has been previously stated, depend on the length of the canal.

On applying our remarks to the case now under consideration, we observe that the external opening was distant about one inch from the anal aperture; and the first thing to be done was to endeavor to pass a probe from one aperture to the other,—that is, from the external opening through the fistulous canal into the rectum, so as to make certain whether the fistula did or did not communicate with the rectum: this could not be accomplished; and it did not at first seem improbable that the case was merely one of blind external fistula, having no communication whatever with the rectum; whilst several points in his history—especially his never having passed any gas or fæces through the fistula—seemed to favour such an opinion: but did this justify us in arriving at a conclusion that no communication existed between the fistula and the rectum?—Certainly not: the passage of fæces might easily have been prevented by the character and direction of the internal opening. All doubt, however, on this point was speedily cleared up by injecting water with a syringe into the external opening, care being taken at the time to prevent it from returning immediately by the same orifice: by these means the existence of the opening into the rectum was easily detected, and, by the aid of the speculum, its exact position, small size, and peculiar character, were rendered distinctly visible. The injection of water is a test by which you can at the same time determine whether more than one opening exists in the gut. In the present case there was only one opening, through which the water quickly passed,—demonstrating all that was required, without causing any pain to the patient; clearly showing its advantages over the probe, which will not unfrequently be found to fail. The cause of failure with the probe in the present instance was quite apparent after the operation, and depended on the canal taking an irregular course; the upper portion appearing, as it were, to branch off at a right angle from the lower.

The internal opening of the fistula in this case was in that position where it is most frequently met with,—viz. about one inch above the internal sphincter: this was pointed out by Ribes and others, and has been more recently confirmed by surgeons of this country. Its exact position can now be more easily made out by means of the speculum, and injecting water into the external opening. If you cannot see in what part of the rectum the water first makes its appearance, which sometimes occurs in consequence of the translucency of the water, some colored liquid should be substituted for it, when the escape through the internal opening will be immediately observed. But even after we had discovered the exact position of the two openings in this case, and proved that they communicated, as shown by the passage of the water, still it was impossible to pass a probe from the one to the other; and the question then arose—What shall be done? as it was important for the success of the operation that the entire length of the fistula should be divided. This difficulty was overcome by passing a director through the external opening, and up the canal as high as it would go; when a probe previously curved on purpose nearly to an

acute angle, was introduced through the internal opening, which was rendered visible by the speculum, and passed down the fistula until it came nearly in contact with the director: the probe was then steadied by the hand of an assistant, and the sphincter and soft parts between the lower part of the canal and the rectum were divided, immediately after which the upper or intestinal portion, which was quite superficial, and occupied by the grooved probe, was served in a similar manner. The walls of the fistula near its upper and lower openings were quite of a different character, those on the upper half being thick, hard, and almost cartilaginous, and lined by a thin, delicate, smooth, pseudo-mucous membrane; whilst those of the lower half were thinner, evidently of more recent date, and the lining membrane presented a minutely granular appearance.

If the fistula does not happen to extend deeper than one inch and a half up the rectum, you should always endeavour to divide its entire length, especially the intestinal end of it,—otherwise, in many cases, it remains open; and, when the rest of the sinus has healed, it allows a small quantity of feculent matter to enter, which becomes a source of irritation, leads to the formation of another abscess, and subsequently to another fistula; so that, unless this is discovered and laid open, you will not place the patient in a condition to expect a favorable termination, and at the same time deprive yourself of the conscientious satisfaction of knowing that you have done your duty towards him.

After the operation, provided there be no hæmorrhage, you may withdraw the speculum: a small piece of oiled lint should then be inserted between the edges of the wound, so as to cause the parts to heal up from the bottom by granulation. This was done in the case related. The patient is now nearly recovered, and there is every reason to believe that he will continue well, without any return of the fistula.

The intention of the operation for fistula in ano in dividing the sphincter is to allow the inner wall of the fistula to come in contact with the outer,—a circumstance which the sphincter, when entire, always tends to prevent. Within a short time after their approximation, the two walls granulate and become adherent, whilst the sphincter is subsequently repaired by the white fibrous tissue. If the precaution is not taken to introduce a piece of lint, the divided edges of the wound will be likely to unite by adhesion, without the fistula having become obliterated. Prior to performing this operation, I would always advise you to examine the rectum carefully, to ascertain if any large artery lies in your intended line of incision. Such a discovery as this would alter your method of operation, so as to avoid wounding it, if possible; and, in concluding my remarks on this operation, I am anxious to impress upon your memory that, although, in most cases, you should endeavor to lay open the entire extent of the fistula, by cutting through all the soft parts between the two openings, still that, under occasional circumstances, certain modifications in the operation must be adopted: and the two conditions in which these modifications are especially called for are—

1st. When the fistula extends high up into the rectum: by dividing its entire length you will run the risk of dangerous hemorrhage at the time, and of subsequent non-union. Under these circumstances you must be satisfied with dividing the sphincter and lower part of the fistula, after which the upper portion will most probably heal up of itself. The second condition under which the operation must be modified is when the fistula has a very extensive track in the soft parts external to the anus: thus, for instance, extending forwards towards the perineum, or laterally towards the buttocks; whilst its intestinal opening will, in all probability, be only just above the sphincter ani. Under these circumstances, do not divide the whole length of the sinus; but, having passed your director through the canal, as in the ordinary operation, cut into the director external to the sphincter, divide it and the intestinal end of the fistula, after which the remainder of the fistulous track—that is to say, the external portion which has not been laid open—will most probably heal up. In case, however, it should not do so, some stimulating injection—as black wash, nitrate of silver, or sulphate of zinc, in solution—may be thrown into it, for the purpose of favouring the process of granu-

lation or adhesion. I have performed this modification of the usual operation in two cases: in one it was attended with speedy and complete success; the second case I lost sight of too soon to enable me to express a decided opinion; but, so long as I had an opportunity of observing it, it promised to do well. Some difference of opinion prevails respecting the primary cause of fistula in ano; it is the opinion with some surgeons that it originates primarily in an ulcer in the mucous membrane of the rectum, leading to the inflammation and abscess external to the mucous membrane, which soon after opens into the intestine; and this permits the entrance of fæcal matter into the abscess; this again gives rise to the formation of another abscess, which burrows down in the cellular tissue external to the rectum, and at last leads to the completion of fistula. But it does not appear to me that this is the correct explanation of the primary case, inasmuch as facts, and analogy between this disease and diseases occurring in other parts similarly situated, do not tend to this conclusion. In the first place, we know that persons are very frequently the subjects of ulcer in the rectum without its ever being followed by abscess, and that the ulcer may exist for months without giving rise to to it; whilst the coexistence of abscess with ulcer of the rectum is a very rare occurrence. These facts are all important as a negative evidence, tending to show that this is not the primary cause. But there is another light in which it must be regarded: the internal aperture of the fistula is in general, if not always, exceedingly small. Now if the original cause was an ulcer in the mucous membrane of the rectum, it is not at all likely that the internal opening would be about the size of a pin's head, or perhaps double that size. Another argument is, that we cannot discover any analogy between this supposed cause of fistula and ulcers occurring in other parts of the body similarly situated. Thus, for instance, an ulcer in the nose is not followed by abscess in the walls of the nose; neither is an ulcer in the pharynx followed by abscess in that part. The same remark holds good when applied to the urethra; an ulcer in the urethra is not followed by abscess near its walls, unless extravasation of urine takes place previously. Indeed, there is no canal in the body in which a precisely analagous and supposed condition is observed. Again, that kind of fistula generally called the blind external fistula—viz., when no communication exists between it and the rectum—is a variety of the disease itself, tending strongly to disprove this idea: so that, judging from these facts, I think we may safely infer that an ulcer is not necessarily the primary cause of the abscess near the rectum which gives rise to fistula; and that, when the two exist at the same time, it must be regarded rather as a coincidence, than that they bear a direct relation to each other. The more probable cause of fistula, perhaps, stands in some relation to an inflammatory condition of the walls of hæmorrhoidal veins, owing to the circulation through them having been retarded for many hours, produced by standing, or by sitting for a long time on a hard seat, or by riding on horseback, or, as I have known it to occur, from sitting on the damp ground.—*Med. Gazette, February* 7, 1851, *p.* 222.

## 87.—CONGENITAL ABSCESS OF THE RECTUM.

(Under the care of Mr. Erichsen.)

[Imperforate anus, absence of the rectum, and other imperfections are now so well understood that it has hardly been deemed necessary to warn accoucheurs as to the necessity of examining infants with respect to these malformations before they are consigned to the exclusive care of the nurse. With regard to affections of the anus.]

Amussat's classification is so simple and practical that it can easily be borne in mind. He makes but five divisions. 1. The anus preternaturally narrowed. 2. Anus closed by a membrane. 3. Rectum intercepted by a single septum. 4. Anus imperforate, (the most common.) 5. Rectum opening into some other organ.* To these might be added:—6. Rectum ending in a pouch very high up; and 7. Total absence of the rectum.

* Of this malformation the following is a very extraordinary instance:—The termination of the rectum is closed, but to it was attached an appendix which ran over the prostrate

[A case of the latter recently occurred under Mr. Erichsen, who has had frequent opportunities of operating for such malformations. From Mr. Watkin Williams' notes, house surgeon to the hospital, we gather the following facts:]

A male child, aged eighty hours, was brought to the hospital, the nurse having observed that it passed no motions, and had no aperture at the anus. The little patient, on being examined, was found to be a very small child; a raphè extended along the median line of the perinæum, and there was no aperture whatsoever on the site of the usual orifice of the anus, nor could any bulging or fluctuation be felt.

As the child was already eighty hours old, Mr. Erichsen lost no time, but at once proceeded to operate. The infant having been placed in the position for the operation of lithotomy, Mr. Erichsen made an incision of an inch in length, terminating posteriorly at the end of the coccyx; the finger was introduced through the wound but no bowel could be felt. The incision was then cautiously carried to the depth of an inch and a half in the median line, Mr. Erichsen taking the curve of the sacrum and coccyx for his guide. The bowel was now felt on a level with the brim of the pelvis, and carefully opened into, when a quantity of dark, thick meconium and flatus escaped. The opening in the bowel was then enlarged with a probe-pointed bistoury, and a plug of wood, wrapped with lint, introduced into the wound, in order to arrest the rather free oozing of blood from the cut surfaces. This plug was fastened by two threads, attached to a belly-band, and one drop of laudanum was given to the child. Between one and two ounces of blood was lost in the operation.

About six hours after the operation, the plug was removed, and a portion of a gum catheter introduced into the bowel, so that the excrement might pass through it. The catheter was held by strings to the belly-band, and a wide tape was also passed round the instrument, and attached at each side to the above-named waist-band, so as to cover the posterior part of the wound, and prevent the excrement from irritating it.

The child lost much blood between the time of the operation and the evening, but it was difficult to distinguish between coagulated blood and meconium mixed with clots. On the next day the patient was going on very well, but the little creature would not take any nourishment. On the third day the child was still doing pretty well, and was very quiet, but it soon grew weaker, and died on the fourth day.

The post-mortem examination elicited the following appearances: The cæcum was small; the transverse colon very long, and presenting a turn in its centre; the descending colon ran towards the umbilicus, then curved into the the left lumbar region, and again descended, to terminate in an expanded cuide-sac, which was attached to the brim of the pelvis, and into which the opening had been made. This terminal portion of the descending colon was increased in diameter to about double of the remaining large intestine.

Mr. Erichsen's operation was so far successful, that he succeeded in finding the bowel, and evacuating the meconium; and it may remain a question, whether the child died of original want of power, hæmorrhage, or irritation from effused excreta. It is well known that M. Amussat, of Paris, after having lost several cases from the latter causes, thought of bringing down the bowel to the artificially-made anal orifice, and fix it there by sutures, in order to afford the meconium a mucous canal towards the exterior, and prevent the inflammation and formation of abscesses consequent upon the effusion of the fæcal matter in the pelvis. He has, if we remember well, put one or more successful cases of this kind upon record.

But the difficulty will always be, the finding of the bowel in the cavity of the pelvis; and Mr. Erichsen was particularly fortunate in meeting with it, the pouch being situated so high up as the brim of the pelvis. Liston was almost over-cautious concerning these operations, for he says, p. 573 of his 'Practical Surgery,'—

gland along the urethra, and opened by a small aperture at the side of the fraenum praeputii. The child was saved by an opening being made in the usual locality of the anal orifice. (Collezione d'osserv. et rifl. di Chirug. t. 1. p. 18, Roma Anno 6.)

"When the rectum terminates at the top of the sacrum, or somewhere between that and the natural situation of the anus, an attempt may be made to reach the cul-de-sac by careful incisions, guided by the finger; but the narrow space does not admit of any deep exploration: the situation of the bladder and of the vessels of the pelvis is not to be forgotten; the plunge of a trocar at random is certainly not warrantable."

J. L. Petit likewise deprecates the puncture of the bowel with a trocar, when the pouch is two inches above the artificially-made anal orifice, as he considers that the effusion of meconium, and the subsequent absence of the sphincter, would in the first case cause death, and in the second, a continual escape of fæces. Should M. Amussat's operation get into favour, some of these drawbacks may be provided against, and a few of the unfortunate little creatures be restored to a normal state.—*Lancet, February* 1, 1851, *p.* 118.

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## 88.—ON ULCERS EXTERNAL TO THE SPHINCTER ANI.

By John Hilton, Esq., F.R.S.

[These affections, giving rise to the most distressing and seemingly anomalous symptoms, Mr. Hilton states, are very often overlooked from want of due attention, and imperfect investigation; and he thinks that a very careful and circumspect examination should be made in all cases where a patient complains of considerable pain in passing his motions, whether accompanied or not by streaks of blood upon the fæces.]

As the sensibility of the ulcer and the character of the accompanying symptoms depends greatly upon the exact situation of the ulcer, I shall divide them into three distinct classes in relation to their position.

1st. Ulcers extending to the sphincter ani. 2d. Ulcers *within the circle formed by the internal sphincter muscle.* 3d. Ulcers *internal* to the sphincter ani.

And the first case which I will adduce is an example of the first class—*viz.*, ulcers external to the sphincter ani:—

*Ulcer external to the Anal aperture.*—T. C., æt. 22, was admitted into Guy's Hospital, under Mr. Hilton's care, November 27th: states he is the driver of a stage waggon, has lived temperately, and enjoyed general good health. About two months since he first complained of pain whilst passing his motions, which has continued to increase up to the present time; it was supposed to depend on piles, for which he was treated, but without deriving any benefit.

On admission into the hospital, he still complains of severe pain whilst passing his motions, and for one hour after, as well as continual soreness and uneasiness around the anal aperture, and on examination several small ulcers, irregular in form, were discovered, varying in depth, though mostly superficial, around the verge of the anus. These, on being touched with the finger-nail, caused him pain and soreness, though not to be compared with that acute sensibility which exists when the ulcer is situated in the mucous membrane within the sphincter. He has been the subject of syphilis twice; but there does not appear to be any connection between this and his present disease. He was ordered to keep in bed in the recumbent posture, and to take castor oil two or three times a day, so as to keep up a gentle action on the bowels; also to apply an ointment, consisting of unguentum opii ʒj et unguentum hydrargyri fortius, ʒiij two or three times a day.

Dec. 3d.—He had found great relief from the application: his bowels were regularly opened, and the motions pass without causing him much pain, whilst the small ulcers show a disposition to heal. From this time he continued to improve up to the 14th, when he felt quite well, all pain and uneasiness having entirely disappeared; the ulcerated fissures had completely healed, and the bowels were moved without causing him any inconvenience.

On reviewing the symptoms in this case, his sufferings, you will remember, were limited to about one hour after the act of defecation had been completed—a period of time unusually short, and of a much less protracted character from that in other cases which I shall have to bring before your notice before we quit the subject. This case also fully indicates the necessity for a

careful personal examination, as I am aware that this patient had been under treatment for piles for some time previous to his admission into the hospital, and without any benefit.

The indications for treatment are—

1st. To keep the patient in the recumbent posture, so as to relieve congestion of the hemorrhoidal veins, through which, you will remember, venous blood is returned to the vena porta, contrary to the laws of gravitation, but which is accomplished by means of valves so arranged and adapted as to support a column of blood of a definite length, and of certain weight. And it is owing to some of these valves having become broken down that the remaining healthy valves are called upon to support a greater column of blood than natural, giving rise to those enlargements and yieldings of the veins just above the sound valves which constitute the true venous hemorrhoids.

The second indication is to keep the bowels open by mild laxatives; and of these the oleaginous appear to me by far the best; for in administering castor oil, which is the medicine I generally employ, it acts on the entire course of the intestinal canal, and at the same time lubricates the hard exterior of the fæcal mass as it passes through the rectum; and, indeed, in all diseases of the rectum you will find in castor oil one of the mildest and best purgatives you can employ.

The painful symptoms in the case I have read were soon partially relieved by these means, whilst great benefit was unquestionably afforded by the local application, consisting of the unguentum opii and unguentum hydrargyri fortius. The opium appears to prove beneficial by diminishing the excitability and irritability of the ulcer; but the modus operandi of mercury as a local application, or in what manner it affects the molecules of the system when given internally, is at present but very imperfectly understood. That the combination is an advantage I have no doubt whatever. The patient suffered most severely during the act of defecation; and this, though very frequent, yet is not always the case, as the pain is often more severe after the act of defecation has been completed. An explanation of the cause of this I shall offer you hereafter.

Very minute fissures, so small as scarcely to be perceptible even on careful examination, yet, when situated on the verge of the anus, may give rise to the most acute pain whilst the stools are passing; and I have known several instances where persons in full business occupation have been quite unable to pursue their avocation in consequence of this source of pain and uneasiness about the rectum, as well as from the mental anxiety and physical depression with which these affections are so commonly associated. One case strikes me very forcibly at the present time; and as I think an illustration of the subject under consideration will be the more likely to impress it on your memory, I will briefly relate it. A gentleman actively engaged in business in the city was suffering from all the symptoms above alluded to, and had been under treatment for some time without any benefit. The rectum had been examined, but without affording any explanation of the cause of the symptoms. Being satisfied, however, in my own mind that it depended on some minute fissure about the anal aperture, which had hitherto escaped observation, I made a very careful and minute examination of the part; and, on making pressure around the verge of the anus, the patient soon expressed severe pain when I touched a particular spot. To this my attention was now especially directed; and, after manipulating so as to make the skin as tense as possible around the margin of the anus, I at last discovered a very minute fissure, scarcely a line in breadth, in that situation; and, on touching it with my finger-nail the patient instantly suffered the most exquisite pain. This case was treated by touching the fissure with nitrate of silver reduced to a fine point by rubbing it with wet lint; and after three or four applications, the patient got completely well, and quite free from those harassing and distressing symptoms with which he had so long been troubled. The fissure in this case appeared to have originated in a small follicle which had suppurated and never properly healed. This follicular disease does not always assume the form of an ulcer or fissure; you will not unfrequently meet with it in practice, where the en-

larged follicle may be seen in a state of ulceration, the ulcer not being more than a pin's head in size, very sensitive to the touch, and painful during defecation, which may be cured by one or two careful applications of nitrate of silver to the ulcerated points.—*Med. Gazette, January* 10, 1851. *p.* 47.

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## 89.—ON IRRITABLE ULCER WITHIN THE EMBRACE OF THE SPHINCTER ANI.

By JOHN HILTON, Esq., F. R. S.

R. H., æt. 38, was admitted into the Hospital under my care, on December 4th, 1850: he is a hale, stout and powerful man, by occupation a blacksmith, residing in Warwickshire. He appears to have drank rather freely, but has lived well, and until the commencement of his present illness enjoyed general good health.

About five years since he became the subject of what was thought to be hæmorrhoids, and at the same time suffered severe pain in the rectum, and straining during defæcation, which lasted for a few hours afterwards; his bowels at the time were quite regular: the evacuations were followed by a small quantity of slimy matter, and the stools were now and then streaked with blood: this weakened him, and caused so much distress as to lay him up for a period of seven weeks, but after the use of some kind of injection these symptoms were quite relieved, and he apparently soon recovered. Occasionally, however, from that time up to twelve months since, he has been subject to attacks of pain of a similar character to that which he formerly suffered from, but which was soon relieved by the use of aperient medicines, and at the same time regulating his diet and habits. Five months ago the pain in the rectum became much aggravated, and has continued more or less up to the present period, but about three weeks since it became most acute during, but more especially after defæcation had been completed, when the pain lasted for a period of 5, 6, or 7 hours: he now noticed a slight purulent discharge from the rectum, occasionally streaked with blood; his bowels are habitually constipated, and his symptoms have been alleviated by the bowels being kept open by castor oil. On admission he complains of intense aching pain around the anus, which is somewhat relieved by diffused external pressure, as well as of a burning sensation during the passage of the fæces, which gives him the greatest horror of defæcation. The introduction of the speculum for the purpose of examining the rectum caused most severe pain, when a glassy, irritable-looking ulcer, about the size of a sixpence, was discovered, just within the embrace of the internal sphincter muscle, and on its posterior aspect, where it was connected with the base of an external pile: ordered castor oil mixture three times a day. On December 10th, his bowels having been freely opened, twice daily since his admission, from which alone he felt somewhat relieved from his pain, the patient was now submitted to the influence of chloroform, and when a state of anæsthesia had been induced Mr. Hilton introduced his speculum ani so as to place the slide of the instrument opposite the ulcer; the slide was now removed, and the ulcer could be seen without any difficulty through the fissured space; the internal sphincter muscle was then divided from without inwards by means of a sharp-pointed bistoury cutting directly through the centre of the ulcer; this was accomplished without any pain to the patient: the pile was removed with scissors. A cold sponge was applied externally, and the patient walked to his bed: the pile removed consisted only of hypertrophied cellular tissue.—Tr. opii. mxxx. statim sumend. 11th. He suffered considerable smarting pain for five or six hours after the operation, but since that time has been quite free from pain or uneasiness in the rectum; he passed a good night, and his bowels have not been disturbed. Pulse, skin, and tongue, natural. 13th. Has passed a motion to-day, for the first time since the operation without experiencing but little pain; the slight pain which occurred was quite of a different character from that which he suffered prior to the operation. 16th. He feels quite comfortable and free from pain; suffers a little uneasiness during defæcation, but none afterwards; there is still a slight purulent discharge. On the 20th, he was quite well, and free from pain

or uneasiness either during or after defæcation; he is to leave the hospital in a day or two. This patient was last heard of on January 12th, when he had resumed his work, and felt perfectly well.

The pain in this case lasted for six or seven hours after the bowels had been moved, and the patient appeared to suffer much more after than during the act of defæcation itself. And, indeed, from the experience which I have had in these cases, this long continuance of pain after defæcation may almost be regarded as pathognomonic of an ulcer being just within the sphincter ani. The situation of the ulcer was in accordance with that which has been most frequently noticed,—viz., on the posterior aspect of theint ernal sphincter, and in that precise spot where the mucous membrane begins. You will remember, that prior to dividing the sphincter, the patient was placed under the influence of chloroform—a very valuable assistance, as it not only subdues the resistance of the sphincter muscles, but spares the patient that most acute and excruciating pain from which persons labouring under this affection so commonly suffer on attempting to introduce the finger through the sphincter, and which must have necessarily been increased by the introduction of the speculum. Great difference of opinion prevails in reference to the primary cause of these ulcers; it is the opinion of some surgeons that they originate in a scratch or minute laceration of the mucous membrane by hardened fæces, or by some extraneous body—as from a fish bone or some other rough substance. I am more disposed to think that they originate in a diseased condition of some of the numerous follicles about the lower part of the rectum. In the present instance, however, the ulcer appeared to have commenced at the base of the external pile, which was removed when the sphincter was divided; and it seems reasonable to infer that it may have been caused in this case by the compression of the sphincter exerted upon the inflamed mucous membrane at the base of the pile.

The patient, as I have previously stated, complained of constant burning pain for some hours after defæcation. And I will now proceed to offer some observations as to why the pain is so cutting during the passage of the fæces, and why that smarting burning pain is so protracted and distressing after as to depress the patient both morally and physically. The explanation is easily understood by remembering the healthy anatomy of the part, which consists of a ring of muscle lined by mucous membrane having a very minute and abundant nervous supply: the sensitive and motor nerves are exceedingly large, and the continuance of pain depends on an excitation and subsequent reflex action upon the sphincter muscle; the pain commences, in consequence of the fæces, during their passage over the surface of the ulcer, irritating the nervous filaments exposed on the surface and around the margin of the ulcer: this irritation, conveyed to the spinal chord by means of the sensitive or excitor nerves, is again reflected back to the sphincter muscle by the associated motor or efferent nerves, causing the muscle to contract in direct opposition to the feculent mass which is about to escape. When the fæces have passed, the margins of the ulcer become approximated, the irritation is again set up, conveyed to and transmitted from the cord, giving rise to a continuance of the symptoms produced by the alternate contraction and relaxation of the sphincter muscle. Patients frequently complain of numerous other distressing symptoms—for instance, lumbar pains, pains or cramps in the course and distribution of the sciatic nerves; there exists also not unfrequently irritability of the bladder, and sometimes retention of urine, dependent on a spasmodic condition of the muscles of the perineum. Such symptoms, though generally considered anomalous, may be explained by bearing in recollection the intimate communication which exists between the pudic, lumbar, and sciatic nerves, and those nerves distributed to the anus.

[The pain which often remains three, four, five, six, or seven hours after defæcation in these cases, is from the compression of the margin of the ulcer by the sphincter muscle; by this the muscle is again excited to contract, and so contraction follows each excitation until the excitability of the muscle becomes exhausted from over-fatigue. In consequence of this increase in its action the muscle becomes hypertrophied and contracts with considerable force

and energy. In the same manner the muscular tissue of the bladder becomes hypertrophied in stricture of the urethra or in stricture of the rectum or œsophagus; the muscle above the constriction increases in size to overcome the obstruction. The force and endurance of the muscle may be observed in cases of disease or injury of the spinal cord, in which the patient loses the power of volition over the muscle, which remains involuntarily closed, until the accumulation of the fæcal matter from its weight and pressure, causes the relaxation of the sphincter.]

The operation for dividing the sphincter muscle is very easily performed; nevertheless it requires to be done with caution, that your incision may not extend deeper than you actually intend or is required. This operation is proposed in reference to the method of contraction of the sphincter muscle, which is towards its own centre; and your object in dividing it is to do away with its contraction in that direction for a short time, so as to allow the fæces to be evacuated easily, and in this way to allay the irritation caused by their passage, whilst the ulcer, being undisturbed by muscular action, rapidly heals up by granulation. The operation being determined on, I would advise you to perform it as follows:—Having ascertained the position of the ulcer, which will most commonly be found to be situated on the posterior part of the rectum, place the patient on his back, or in any convenient position, on a table or bed before you. The speculum should now be introduced, with the slide corresponding to that part of the rectum in which the ulcer is situated: when the ulcer is clearly seen, the internal sphincter muscle should be divided from without inwards by means of a sharp-pointed bistoury carried directly through the centre of the ulcer. Some surgeons, however, object to the division of the sphincter by the knife, and recommend the forcible introduction of the finger through the anal aperture, in order to rupture some of the muscular fibres of the sphincter, and so favour the healing of the ulcer by granulation. This operation is very uncertain in its effects, and I have never yet known it to succeed. Other surgeons advise the introduction of the finger up the rectum, and having passed the straight probe-pointed bistoury upon it, to divide the sphincter from within outwards. This operation requires extreme caution, as you will be liable to wound more than you intended or more than is necessary, especially if the patient should chance to move his pelvis at the moment of the operation. In one instance which has come under my observation, where the sphincter was divided in this manner, the operation was followed by profuse arterial hemorrhage, which required pressure with the finger for several hours before it could be arrested.

In a second instance the hemorrhage was so severe from a large artery as to retard the recovery of the patient for a considerable time; and there is not much doubt but that cases have occurred in which the pudic artery itself has been divided by this mode of operation. Another disadvantage, also, is the liability of inflicting a wound upon the surgeon's finger by the subsequent effect of the simple puncture, of which, in operations about the rectum, more than one life has been lost. Another mode of performing the operation is by introducing the conical end of a tallow candle up the rectum, and then with the sharp pointed bistoury, dividing the sphincter from without inwards, the point of the bistoury being buried in the candle, when both are withdrawn, and thus preventing the liability of wounding the opposite wall of the rectum. I think, however, it is always far preferable to see what one is about, than to perform an operation as it were in the dark; and it is on this ground especially that I recommend to your notice the speculum ani which I am in the habit of using: in size and shape it resembles the ordinary speculum, being about three inches in length. It differs from it, however, in being of plated metal instead of glass, whilst a quarter of its circumference is made to slide in and out in a small groove. On first introducing the instrument, you should always endeavor to place the slide opposite the ulcer; and having effected this object, the slide should be withdrawn, when the size and character of the ulcer can be clearly seen. The speculum is also furnished with a handle, which places it more under your command during its introduction, and enables an assistant to steady it in any position you may require

whilst performing the operation. In addition to the great advantage of seeing what you are about, the speculum also enables you to discover the source, and arrest any hemorrhage that may arise as the consequence of the opera-

tion. Thus, if important bleeding should come on after the sphincter has been divided, do not attempt to withdraw the instrument immediately, but search for the bleeding vessel, and if it proceed from an artery (for branches of the hemorrhoidal are occasionally divided), place a ligature upon it; but if it be a general oozing of sufficient importance to require its arrest, plug the speculum with lint; by so doing you may make pressure to any extent you please on that part alone where it is required. These remarks apply also to the operation for fistula in ano. Not many months since, I divided the sphincter of a patient in the hospital for this disease, when a small artery bled very freely. By the aid of the speculum, however, I had no difficulty in seeing and securing it, thus placing the patient in a state of comparative safety after the operation, and relieving him and myself from that anxiety and apprehension which must always exist while hemorrhage continues. These circumstances all tend to show the advantage derived in dividing the sphincter, by the use of the speculum, over the other modes of operation which have been recommended; it enables you to see clearly what you are about, and places any hemorrhage that may occur under your immediate control, and may be compared to performing an operation in the light instead of the dark.

The next question for consideration is the extent of division necessary. And in answer to this I would advise you to divide the sphincter to about half an inch in depth, cutting directly through the centre of the ulcer. The most perfect operation that can be performed is to divide the muscular fibres down to a sheath of whitish yellow cellular tissue, which lies immediately exterior to the sphincter muscle; this layer of cellular tissue should not be touched: it cannot, however, always be seen; but when exposed, it affords the most certain indication that the operation has been perfectly completed: when the muscle is divided, a gap, of course, is left between the two portions, and this, after a time, is filled up by white fibrous tissue: muscular fibre never being reproduced: this new tissue, not being contractile, allows an easy passage to the fæces until the ulcer is healed, and when the patient is restored to his usual health, and the sphincter has resumed its normal action, this newly formed tissue must be regarded rather as an advantage than a detriment to its natural offices, inasmuch as it prevents spasmodic action, and allows the easy escape of feculent matter at all times.

The mode of treatment to be adopted after the operation has been performed may be somewhat varied. I have been sometimes in the habit of introducing oiled lint between the edges of the wound, with the intention of causing it to heal up from the bottom by granulation. This, however, is not absolutely

necessary; and its insertion and retention often causes considerable pain to the patient: a cold sponge may be applied externally over the anal aperture for the purpose of checking hemorrhage and keeping down the temperature of the part. In addition to the ulcer, which in the preceding case was situated in the direct embrace of the sphincter, the patient was also the subject of a small external pile. This I removed with the scissors after dividing the ulcer. On cutting into the pile afterwards, it proved to be nothing more than hypertrophied cellular tissue, covered by a prolongation of the mucous membrane and adjacent skin; and whilst speaking of this, it may, perhaps, not be out of place to suggest to you that when this kind of pile becomes much swollen, the liquor plumbi diacetatis in a pure and undiluted form will be found a most valuable application, as from its astringent properties it corrugates the pile; and in some cases it has acted so well as to do away altogether with the necessity for any further treatment. I will now proceed to point out to you some of those additional circumstances produced or induced by ulcer of the rectum; and amongst the most prominent of these may be mentioned constipation. This I have already alluded to as a symptom in most cases of ulcer of the rectum; but there is another light in which it must be regarded, and the cause of which, on being first discovered, often assumes a very serious character, giving rise to great anxiety and distress to the patient, and respecting which you will be very likely to form an incorrect diagnosis if its nature and origin be not correctly understood. I allude to enlargement of the glands in the neighbourhood of the rectum; and perhaps my meaning may be best explained by first drawing your attention to a state of things essentially similar occurring on the exterior of the body, where the commencement and progress of the symptoms are better noted from being from the beginning under ocular demonstration, and on that account more easily understood. Thus, for example, when a person has an ulcer on the toe, you are not surprised to find an enlargement of the glands in the groin, owing to a morbid fluid having been carried there through the medium of the lymphatics, extending from the ulcer on the foot, and opening into those glands. An ulcer on the prepuce also gives rise to an enlargement of the glands in the groin in a similar manner: so it is with the rectum; an ulcer in its mucuous membrane may give rise to enlargement of some of the numerous lymphatic glands situated around the rectum; and these glands, as you will remember, lie close to very important parts, by pressure upon which one can readily understand the seemingly anomalous symptoms which occasionally manifest themselves.

Thus in the male these glands are adjacent to the peritoneum, the prostrate gland, and the urinary bladder; whilst in the female their contiguity to the ovaries and uterus, &c., may give rise to a new set of symptoms associated with the implication of these organs. So that there is nothing peculiar about these sympathetic glandular enlargements, as they are termed; it is a condition often observed in other parts of the body, and may be explained on common principles. When these glands, however, become enlarged they necessarily diminish the calibre of the gut, by encroaching on its walls, and give rise to one form of stricture of the rectum, with all its attendant symptoms, consisting of pain, straining, and difficulty in voiding the fæces, which, under such circumstances, are passed in small flattened pieces, frequently accompanied also by irritation of the bladder or uterus, and cramps in the lower extremities. Several instances of this sympathetic enlargement of the glands upon the rectum have come under my own observation, one or two of which I will briefly relate in illustration:—

About twelve years since a gentleman, twenty-five years of age, had undergone the operation of dividing the sphincter for an ulcer situated at the anal aperture. The wound assumed a very unhealthy aspect, his general health became much impaired, and pelvic symptoms supervened. On making an examination of the rectum, several large, hard, rounded, and tender masses were felt pressing upon the rectum, distant about two or three inches from the anal aperture, and were very much feared to be of a malignant character. The patient was sent into the country for the purpose of improving his general

health, when the ulcers healed, and in about six weeks he was quite recovered, without any evidence of glandular enlargements remaining.

A second case came under my notice in May, 1849, in a lady, æt fifty, who had an ulcer at and within the margin of the anus, extending inwards to the size of nearly half-a-crown, from which she had suffered upwards of eight months, and which was attended with a passage of blood in the fæces. The rectal glands could be felt much enlarged, and encroaching upon the rectum, giving rise to so much difficulty in the passage of the fæces as to require half an hour or more for the completion of defæcation. I divided the internal sphincter muscle; the enlarged glands disappeared and the patient perfectly recovered.

It is the opinion of some surgeons that stricture from spasmodic action of the sphincter ani may exist without any local excitant in the shape of an ulcer or fissure: but I have never seen a case in which it has been satisfactorily proved. One case of clonic spasm of the sphincter ani came under my notice where no ulcer could be detected; but in this case there could be no doubt, as the result of treatment proved, that it depended on irritation originating in the prostrate gland.

In concluding my remarks on the treatment of these ulcers, I may state that it is not always necessary to divide the sphincter ani. The local applications of mercurial ointment, with belladonna or opium, are sometimes quite sufficient to relieve the patient, at the same time maintaining the recumbent posture, and regulating the bowels by mild oleaginous purgatives. If this does not succeed, nitrate of silver should be applied every second or third day, the object being to destroy the surface of the ulcer and its margins. The application should be carefully made by the assistance of the speculum ani. Nitrate of silver appears to act beneficially by producing a more healthy secretion, and exciting a more healthy action in the part. Opium alone is in some cases of great value as a local application; but you should always watch its use very carefully, as patients are often apt to think that the more they apply the sooner they shall get well; and it has happened more than once that they have become narcotized from its effects.

It does occasionally occur that a patient has two ulcers at the anal aperture at the same time; and under such circumstances, as a rule, it is not necessary to divide both. In this case of double ulcer I would advise you to divide the posterior in preference to the anterior; for if you divide the anterior, the feculent mass, in its escape from the rectum has a natural tendency to proceed backwards as well as downwards, would sweep over the posterior ulcer, and thus keep up a constant source of irritation: if, however, when the posterior has been divided, the anterior does not heal, apply nitrate of silver to it, and then both will probably heal up; but should the anterior ulcer persist after the healing of the posterior, it may be subjected to the operation of division.

All ulcerations within the anal aperture are not necessarily the result, either of a scratch in the mucous membrane, or of a diseased condition of some of the follicles about the rectum; but these ulcers sometimes owe their origin to a specific poison, and are in truth ulcers of a specific character,—or, in other words, chancres. These may in general be recognised by the ordinary characters of chancre occurring in other parts: their chief diagnostic marks being hard bases and raised edges, whilst they are the result of inoculation.

In the treatment of such specific ulcers it is an important point to determine whether it be right to divide the ulcer and the sphincter at once, according to the method of treatment adopted in the ordinary ulcer, or in the first place to endeavour to effect a cure by a constitutional plan of treatment. If the patient can lay by for a time, I would recommend you always to adopt the latter course in preference to the former; inasmuch as, when the sphincter has been divided, the cut surface of the wound may take on the same kind of morbid action, and assume the precise characters of the original ulcer: so that your safest and most judicious course would be to treat the specific ulcer by its appropriate remedies, as mercury, &c., but if, after a time, you have reason to believe that the specific constitutional taint has been eradicated, and yet

the ulcer does not heal, you can then with safety treat it in the ordinary method, by the division of the internal sphincter muscle.

Sometimes ulcers at the verge of the anus assume a decidedly malignant character, and give rise to considerable anxiety respecting their progress and probable termination. A case of this kind came under my notice, about four years ago, in a man of middle age; the disease did not present the usual characters of a common ulcer about the anal aperture, neither was there any evidence to show that it was of syphilitic origin. Nitrate of silver was repeatedly applied, but without producing any benefit; and the general aspect of the ulcer was quite of a malignant character. As there were no co-existing glandular enlargements about the rectum, I excised the ulcer, and removed at the same time a small triangular piece of the margin of the anus, including a portion of the sphincter; taking care to cut away the whole of the disease. The result was very satisfactory, as the patient recovered, and had no return of the disease afterwards.

If you have any suspicion in your mind that the ulcer is of a malignant character, do not divide the sphincter at once, under the idea that after all it may be merely an aggravated form of the common ulcer; for, by doing this, you will not afford the patient any benefit, but, on the contrary, do a great deal of harm, and at the same time materially interfere with the success of any subsequent operation.

Associated with this subject, is another, of equal importance, which I have not previously spoken of, and the nature of which is very likely to be misconstrued, if its cause be not properly understood: I allude to those small ulcers occasionally observed in the fourchette in the lower part of the vagina,—a disease of by no means unfrequent occurrence, and of an exceedingly painful and sensitive character, and one which very often remains for a long time uncured. It originates in a diseased condition of the follicles in that part, being quite independent of any specific cause. The treatment must be conducted on the same principle as that for ulcer at the anal aperture, and consists in the division of the sphincter vaginæ, which is best effected by passing the bistoury through that muscle, on the same side as the ulcer, and about one-fourth of an inch above the fourchette; after which the ulcer, in general, speedily heals.—*Med. Gazette, January* 24, *p.* 133, *and February* 7, 1851, *p.* 221.

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## 90.—ON THE TREATMENT OF PROLAPSUS RECTI.

By JOHN MACKENZIE, Esq., Surgeon, Naval Hospital, Archangel.

[The following mode of operating for this obstinate affection cannot but be interesting, as Dupuytren's *plica*, even with its risk of internal hemorrhage, oftener fails than succeeds, and the same remark also may be made with regard to the use of the actual cautery.]

Before proceeding further I shall make a few remarks on the nature of the disease, in order to explain the *modus operandi* of the method in question. It must necessarily follow, before a falling down of the rectum can take place, that its attachments to the surrounding parts must have given way: besides, there obtains, in cases of long-standing, a relaxed or atonic state of the levator ani muscles, almost approaching to paralysis: so that protrusion takes place from the slightest exertion, even in the simple act of walking. In order, then, to effect a radical cure, it is necessary to use such means as shall restore this lost adhesion, by exciting sufficient degree of inflammation for this purpose, and which, at the same time, shall prevent protrusion till adhesion takes place, and shall rouse the nervous and muscular energy of the sphincter and levator ani muscles. This is effected in the most satisfactory manner, without the slightest danger to the patient, by passing a strong ligature, by means of the crooked needle, through the anal aperture laterally, introducing the needle at the distance of an inch from the verge of the anus on the left side, and transfixing the rectum at the depth of half an inch, making it emerge on the right side at the same distance as on the opposite. This being done, the ligature is firmly tied, and the patient is put to bed, with ice applied to the part, to prevent undue inflammatory action.

The presence of this ligature, or rather suture, causes considerable pain and excitement. The sphincter is observed to contract forcibly, the pulse quickens, the skin gets hot, and the cheeks become flushed. The ligature is maintained till its presence has brought on considerable fever, or the pain becomes intolerable, when it is removed, and the ice continued for several days, till the cure is completed.

Case I.—While assisting at some operations at the Military Hospital of this place, on the 12th of January, O.S., 1851, the head medical man of that hospital, Mr. Schmidt, asked my advice respecting a case of prolapsus ani of long standing. The patient, a soldier, aged 35, Ambrosini Molin, of strong frame, had laboured under this disease for a year and a half; there was so much weakness of the sphincter muscle, that the prolapsed gut could not be retained, but always protruded to the extent of three inches. From the prolapsed part there was a copious and constant discharge of mucus and bloody serum, by which he was reduced to extreme exhaustion; he looked pale and leuco-phlegmatic, like a person labouring under long-continued hemorrhage; he said he felt so miserable, that life was a burden to him. The operation was performed by me, as above described, at one o'clock that day, and in twelve hours' time there was so much pain and fever that it was found necessary to remove the ligature, continuing the constant application of ice. In twelve hours more the fever had subsided. On the fourth day, to relieve the bowels, a dose of castor-oil was given to the patient, which operated without any sign of protrusion, nor did a relapse take place from that day forward.

Case II.—Peter Simakoff, a retired soldier, aged 35, entered the Military Hospital on the 3rd of February, 1851, ill of prolapsus ani, and from the patient being in a state of mental imbecility it was impossible to find out from him how long he had laboured under the disease; all we could ascertain on this head was, that he had been in the hospital in the beginning of 1850, ill of the same complaint. On February 18th I operated upon him in the same manner, and as no fever ensued the ligature was continued till the fourth day, when it was removed, no protrusion following the use of the bowels, which was obtained by means of cold injections. On the 25th, the patient, from long straining, brought on a slight relapse, in consequence of which I found it advisable to operate a second time, in order to effect a radical cure. I accordingly applied the ligature again on the 27th of February, avoiding this time the application of ice for four hours after the operation, so as not to prevent the necessary degree of inflammatory action. On revisiting the patient on the 28th, I found him in a violent fever; yet, from his state of imbecility, he complained of no pain. The ligature was removed, and ice continued. Since, no relapse has taken place, and to all appearance the cure is radically complete.

This case clearly shows that the ice should not have been applied in the first instance, until febrile excitement had shown itself. I look upon this agent, however, as powerfully conducive to the cure, inasmuch as it moderates inflammatory action, while at the same time it tends to keep up the spastic action of the sphincter ani muscle after the ligature is removed.

Case III.—Kanagool Thangaroff, a Tartar of the Kirgis tribe, aged 31, a soldier of strong athletic frame, entered the hospital for the cure of prolapsus ani on March 9th, 1851; the disease was of two years' standing, and proceeded, to the best of his knowledge, from long continued diarrhœa. On stooping, the gut protruded to the extent of two or three inches, the anal aperture dilating enormously. On the 10th, at one o'clock, P.M., I performed the operation as described, with this little difference, that the needle did not penetrate so deeply; this was owing to the anus being, in this case, so deeply sunk in the outlet of a very narrow pelvis. On tightening the ligature the patient complained of much pain: he was put to bed with orders not to apply ice until some fever had set in, which took place in the course of five hours. In the evening he felt a call to go to stool, when cold water was injected per rectum, and the bowels relieved, the ligature offering no resistance.

11th.—The fever much less; still considerable pain from the ligature; bowels twice open.

12th.—Being the third day of the operation, there was no fever, and the pain from the ligature was little complained of.

On the 13th, the ligature was removed, and caution given to inject cold water per rectum, previous to his going to stool, and to avoid straining. No protrusion has taken place since, notwithstanding that the bowels have been open twice a day. The cure may be considered as permanent.—*Med. Gazette, April* 18, 1851, *p.* 676.

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### 91.—TREATMENT OF HÆMORRHOIDS BY OPERATION.

By F. C. Skey, Esq.

[Mr. Skey believes he avoids, in operating in hæmorrhoidal cases, the liability of bleeding after the use of the knife alone, by combining the use of the knife and ligature together, which he does in the following manner. He says:—]

The mode I allude to consists in passing a thin copper or iron wire in the form of a loop, made through a double canula around the root of the growth, and strangulating it by drawing the wire tight. This being accomplished, the canula may be retained in this situation for any length of time, from half an hour to an hour or more, and the pile may then be removed with the knife or a pair of scissors; and, as it is far easier to arrest bleeding at the commencement than when established, so, should bleeding occur, immediate pressure should be applied by the finger or by pads of lint. Serious hæmorrhage, however, is a rare occurrence.—*Brit. and For. Med. Surg. Review, April* 1851, *p.* 295.

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## URINARY ORGANS.

### 92.—STRICTURE OF THE URETHRA.

By Professor Syme.

[On this subject of discussion and dispute we ought fairly to remember what are the cases in which Mr. Syme recommends the operation—they are, 1st. Not strictures of the ordinary kind, but those which resist all the ordinary modes of treatment. 2nd. Only those cases are selected which have resisted dilatation, or which have speedily contracted after dilatation. The cases, therefore, operated on by Mr. Syme, are not all cases indiscriminately which are brought before him, but only the worst of these; they must, therefore, be comparatively few. If the different practitioners who have written on this subject would bear this in mind, they would perhaps give more time for the full development of the success of Mr. Syme's operation. In a letter to the editor of the Lancet, Professor Syme makes the following remarks upon his method of treating strictures:—]

The positions which I have endeavoured to establish are,—1st, that the division of a stricture by external incision, upon a grooved director, passed fairly through the contracted part, is an operation free from all ordinary sources of danger. 2nd, that by this procedure, strictures which resist every other mode of treatment, and are apt to resent seriously even the gentlest use of simple bougies, may be speedily removed, so as to allow instruments of the largest size to be introduced without difficulty or inconvenience; and 3d, that the relief thus afforded is more permanent than that which can be obtained in any other way.

In support of the first position, I hope it will be sufficient for me to state that I have performed the operation in thirty-five cases *without a single fatal result*.

In regard to the second and third positions, I trust that such facts as the following, and similar ones, of which I can send you an ample supply, will be deemed satisfactory evidence.

Case 1.—J. McM——, aged twenty-seven, a farmer, from the neighbourhood of Belfast, recommended to my care by Dr. Moore of that place, was admitted into the Royal Infirmary on the 8th of November, 1850, on account

of stricture of the urethra, under which he had laboured for the last ten years. He attributed the disease to a bruise of the perinæum, attended with hæmorrhage from the urethra, which had been sustained from his having been thrown with great force upon the shoulders of a horse he was riding. The symptoms of stricture succeeded, and were followed by an abscess of the hip, with fistula in perineo. Through the use of bougies this opening closed; but as the stricture remained, he four years and a half ago was repeatedly burnt with caustic, with the effect of rendering the contraction tighter than it had been previously. The permanent introduction of catheters, which were left in for a week at a time, was then tried without any benefit, but with the further aggravation of an inflamed testicle. Fomentations and leeches were afterwards employed so assiduously, that the patient declared he had applied no fewer than a thousand of the latter. He had repeatedly suffered from retention of urine, which required the catheter for his relief. In these circumstances, feeling unable for any active exertion, or even to exist with comfort and safety, he had come from Ireland very desirous of obtaining relief, and willing to suffer any treatment that might be considered likely to afford it.

Upon examination, it was found that there were three strictures—one very near the orifice, of no great tightness; another very tight, about three inches back; and a third no less so, between five and six inches from the orifice. Bougies of the smallest and second smallest size were repeatedly introduced into the bladder, without the slightest force, or the effusion of a single drop of blood. But the patient, instead of experiencing any relief from the attempts thus made to effect dilatation, complained of the symptoms being greatly aggravated, so that he could void his urine only by drops, with much pain and straining.

On the 18th, a grooved staff of sufficiently small size was passed through the anterior stricture, and a subcutaneous incision having been made at the fore part of the scrotum, the contracted part of the canal, which could be felt distinctly much thickened and indurated to the extent of half an inch, was freely divided. The staff was than passed through the posterior stricture, which was divided by external incision in the perinæum. A No. 7 silver catheter was then passed into the bladder, and retained by the requisite fastenings. There were only a few drops of blood lost during the operation, and but little afterwards.

On the 20th the catheter was removed. On the 24th the patient expressed himself as quite well. Only a few drops of water escaped through the wound in the perinæum, but in the situation of the anterior stricture there was an abscess the size of a hazel nut, which was evacuated by incision.

On the 27th the urine had ceased to pass at all by the perinæal, but continued to issue through the anterior opening. A full-sized bougie was passed without difficulty into the bladder.

On the 9th of December the anterior opening was quite closed, and on the 17th the patient was dismissed, declaring that he felt completely relieved from all the distressing symptoms under which he had previously laboured.—*Lancet*, *Jan.* 25, 1851, *p.* 96.

Case 2.—George T——, aged forty-five, began to suffer from stricture about eight years ago. Between six and seven years ago he was twice under my care; first for a short period, during which the contraction was only partially dilated, and afterwards for six weeks, when the process was completed through the use of simple bougies. He than went to Canada, and was employed in a remote part of the colony as the agent of a mercantile establishment. Finding the stricture again troublesome, he repaired to ——, where various attempts were made to pass instruments, but without success. In these circumstances he was advised to seek my assistance; and having crossed the Atlantic with this view, was admitted into the Royal Infirmary on the 12th of June last. The perinæum was greatly swelled and very hard, so as to form with the posterior part of the scrotum one mass of induration. On proceeding to examine the urethra, I found a tight stricture anterior to the bulb, through which a bougie of the smallest size was passed fairly into the bladder at the first attempt. I then carried on the dilatation with the effect of removing the perin-

real hardness and relieving the patient from his distressing symptoms, so that he was dismissed as cured on the 11th of September.

On the 21st of November he returned in a worse plight than ever; the swelling in the perinæum having recurred to more than its former extent, and there being not only very frequent calls to void his urine, but also an inability of retaining it. I had no doubt that through the use of bougies temporary relief might again be afforded; but from the repeated relapses which had taken place, distrusting the permanency of any good effect obtained in this way, I concluded that division of the stricture would be expedient, and to facilitate this proceeding, made a free longitudinal incision through the perinæal swelling, which was afterwards poulticed for a few days.

On the 28th, the swelling having become greatly diminished in size and hardness, I introduced a grooved director, divided the stricture, and secured a moderate-sized catheter in the bladder. The bleeding at the time of the operation and subsequently to it did not altogether exceed two tea-spoonfuls. The catheter was removed on the 30th. The urine came partly by the urethra and partly by the wound until the 17th of December, when it flowed entirely by the natural channel. On the 24th the wound was completely healed; instruments of the largest size were introduced and withdrawn without the slightest difficulty or feeling of constriction, and the perinæum was perfectly natural in form as well as consistence. The patient remained another week, and was then dismissed, expressing the most confident persuasion, founded upon the difference of his feelings from those experienced on any former occasion of relief, that he was at length free from stricture; his reply, when asked how the stricture was, always being, "I have no stricture now."—*Lancet*, *February* 15, 1851, *p.* 176.

Case 3.—Towards the close of 1844, Dr. Wickham, of Penrith, brought me a patient, apparently labouring under very formidable disease of the urinary organs. His age was about forty-five years, during twenty-seven of which he had suffered from stricture of the urethra, and been under the treatment of several practitioners. Latterly, finding the complaint more troublesome than at any previous period, he had repaired to a surgeon in Yorkshire, who had formerly afforded relief, and remaining under his care for many weeks, without experiencing benefit, or indeed ever getting an instrument passed through the contracted part: and, in addition to his other sufferings, he became afflicted with a swelling in the perinæum, of such stony hardness, as to suggest the suspicion of carcinomatous degeneration.

On examination, I found that a full-sized bougie could be carried down to the verge of the anus, and consequently beyond the region of stricture, but no farther: from which I inferred the existence of a false passage, resulting from the means that had been used, through the forcible and continued pressure of a large catheter with the view of thus effecting dilatation—a method, it may be remarked, which, like some other means of treatment, is most applicable to those cases where the stricture exists only in imagination. The perineal swelling was about the size of a hen's egg, distinctly circumscribed, and extremely hard, but on the whole suggested the idea of its being the effect of local irritation, rather than of malignant action.

I therefore commenced the treatment by making a longitudinal incision in the course of the raphe of the perinæum, and then applying poultices with the effect of greatly reducing the induration and enlargement. Through careful exploration of the urethra, a small bougie was then conveyed into the bladder, and followed by a succession of larger ones, until the patient seemed able to go home with the prospect of complete relief. In a very short time after doing so, he began to suffer as before, and in the spring of 1845 again placed himself under my care, with all the symptoms of stricture in their most aggravated form.

I then resolved to divide the stricture by external incision, and did so upon a grooved director, which was with some difficulty guided through the contraction. Upon trying to pass a catheter into the bladder, I encountered an unexpected difficulty, from the instrument constantly taking the false route, so that after descending to the verge of the anus, it could not be advanced far-

ther. Concluding from this that the contracted part had not been sufficiently divided, I reintroduced the director, and extended the incision through the urethra beyond the orifice of the false passage; after which, a catheter was readily conveyed into the bladder. The patient experienced no inconvenience, and in the course of two or three weeks was completely restored to health, far beyond what he ever expected, or almost recollected, to have enjoyed.

About three years afterwards, having, as it was alleged, led a rather irregular life in the interval, he returned under the apprehension of a relapse being threatened; but I found that the urethra, though slightly contracted, readily admitted instruments of the full size, and therefore sent him home, with advice to have a bougie passed occasionally by Dr. Wickham. In a letter from this gentleman, dated the 11th current, replying to an inquiry from me as to the patient's state, it is said that he had bougies passed regularly for a considerable period, but for a long while passed has not made any application for the purpose. Dr. Wickham adds, "I have always considered this as a capital case, and should any of my patients get into the same state, I shall strongly recommend the same means of relief to be used."—*Lancet, March* 1, 1851, *p.* 236.

[With regard to the danger of the operation and the permanence of its effects, Mr. Syme says in another paper:]

As to the danger of the operation, I contend that if the incison be made in the mesial line of the perineum, there is no vessel of the slightest consequence that can be cut; and that, if the deep fascia of the perineum is not divided, which it never requires to be, there cannot take place extravasation of urine, unless perhaps forwards in a slight degree into the scrotum, where it may occasion a little suppuration, utterly unworthy of attention, when compared with the great object in view. I therefore maintain, that the operation is absolutely free from danger; and appeal to the fact, that I have performed it between forty and fifty times without a single fatal result.

With regard to the permanence of the effect, I have ascertained beyond question, that even in the most severe and obstinate forms of the disease, complete and permanent relief may be afforded by the operation. But my opponents would seem as if they had understood me to say, that it *must* produce this effect, and have eagerly endeavoured to hunt out some case of relapse, as a complete extinguisher of the procedure. Now it is really difficult to imagine anything more unfair or illogical than this proceeding on their part, since, independently of all other circumstances calculated to influence the result, it is plain that any imperfection in the operation itself may prevent the result from being successful. A single instance of unequivocal success should therefore counterbalance almost any amount of partial or complete failure. But in point of fact, the result of my practice has been entirely favourable, with hardly any exceptions, and these I doubt not might have been avoided with the assistance of more extended experience and knowledge of the circumstances adverse to complete attainment of the object in view. The precise extent to which the stricture requires to be divided, does not appear to be the same in all cases; and I have also generally remarked, that when the wound of the urethra heals by granulation, instead of the first intention, there is less risk of future trouble. In the 'Lancet,' there lately appeared a letter recommending attention to this circumstance, as the sure means of affording permanent relief, but without any mention of the fact, that the author, being one of the pupils of my class, had heard me express a suspicion to this effect in my lectures, and witnessed a case treated in accordance with it. Upon these, and various other points connected with the operation, I have been carefully making observations for several years past; and when they have been tested by time, so as to be matured from crude speculations into trustworthy principles, I shall not fail to bring them before the notice of the profession.—*Monthly Journal of Medical Science. April.* 1851. *p.* 337.

Dr. MACKENZIE remarks, that in estimating the danger attending the division of the strictures on a grooved director, the consequences of the old operation should be kept entirely out of view. The two operations were essentially different. In the operation proposed by Mr. Syme, the limits of the part requiring division were distinctly defined, and the extent of the induration was

felt by the finger, when the urethra was exposed by external incision. The point of the knife was made to enter the groove in the instrument immediately behind the induration, and pushed forwards, till the gristly texture constituting the stricture was fairly divided. The urethra was thus divided in the mesial line, and no more was cut than the contracted portion. In the old operation, on the contrary, the knife was plunged into the dilated part of the canal behind the stricture, and was carried forwards as nearly in the course of the urethra as the operator could guess, till it met the point of a catheter introduced down to the seat of stricture. In addition to the incision being thus a more extensive one, there was no certainty as to the parts which were divided, as to the urethra being opened in the mesial line, or even as to the constricted part of the canal being laid open at all. A passage was certainly established, by which the catheter could be introduced into the bladder, but a very different one from that formed by cutting on a grooved instrument passed through the stricture.—*Monthly Journal of Med. Science, April*, 1851, *p.* 384.

[Professor MILLER, of Edinburgh, seems to us to have taken an impartial and correct view of these cases. Mr. Syme, himself, only selects those cases which have resisted all ordinary treatment. Mr. Miller does not underrate the importance of the operation in these instances, as will be seen by the following remarks. He draws the following conclusions :]

1. That most strictures are permeable; that the great majority of these are curable by other and safer means than perinæal section; and that the metallic bougie and catheter, when rightly used, are neither so injurious nor so inefficient as Mr. Syme has represented them to be. 2. That permeable strictures, which refuse to yield to cautious and correct instrumentation, combined with suitable general treatment—strictures, also, which yield in part, but speedily and pertinaciously relapse—and strictures which are so impracticably irritable as absolutely to interdict the use of instruments, even with the aid of chloroform, opium, Indian hemp, nitrate of silver, &c.—that such strictures may and ought to be treated by perinæal incision, after the manner of Mr. Syme; *but that such strictures are very few.* I may add that strictures which, though bad, do not yet come altogether within the preceding category, may be subjected to perinæal incision, when *time* happens to be of great importance; where the patient, for example, is a labouring man, and anxious to be as short a time as possible laid aside from the maintenance of his family. 3. Those strictures which are impermeable, or ought to be considered such—and they may be expected to prove still fewer—should be treated by perinæal section, after the old method—making a direct incision in the central raphé down upon the obstructed part, guided towards the limits of this by a catheter or sound passed down to the stricture, in front, and by the dilated portion of the urethra behind, cutting through the stricture completely, endeavouring to open the primary canal, and lodging a catheter of medium size in the bladder.

The new canal is not necessarily either "tortuous" or "imperfect;" and the [illegible] pressure of dilatation behind the stricture, already alluded to—never [illegible] than the membranous portion of the urethra—prevents "the im[illegible] hazard of failure in accomplishing the introduc[illegible] catheter into the bladder." The best proof of the safety of the pro[illegible] that it has been practised successfully by Sir B. Brodie, Sir C. Bell, [illegible] "without difficulty"), Mr. Jameson, and, besid[illegible] though, indeed, the last-named gentlema[illegible] somewhat equivocal innovation of renderi[illegible]

[illegible] monograph, I would respectfully [illegible] the risk attendant on the use of the [illegible] treatment of stricture, he has understat[illegible] proposed by him is adv[illegible] That it is not [illegible] strictures [illegible] impermeable. 4. [illegible] towards cure, [illegible] The operation will [illegible]

not often, sufficient of itself to cure. 7. That, subsequently to the operation, instrumentation is required in the ordinary way; the main use of the incision being, besides diminution of morbid irritability, to give the practitioner a good *start* in the use of the bougie, as after tying in a catheter. 8. When cure is completed by instrumentation following on incision, dilatation may be expected to prove permanent; inasmuch as such cure may not depend on a mere expansion of the primal canal, but on something like *reproduction* of a portion of the urethra at the strictured part—a supposition which seems encouraged by the case narrated by Sir C. Bell, (p. 130, Surgical Observations,) in which he states he not only cut into, but actually "*cut out* a portion of the callous urethra;" and, notwithstanding, the patient was cured through the use of bougies, "making a full stream of urine by the natural passage." The orditissues at the part may be condensed, changed, and invested by a membranous lining, so as to cure the constriction by not merely dilating the old canal, but by *patching*, or *letting in* a new portion. Towards this end, however, it is very obvious that the use of the bougie, subsequently to the operation, is quite essential.

Or, further to condense, I believe that Mr. Syme's operation is a good operation, and an important addition to operative surgery, applicable to certain bad —very bad—strictures, which, however, are likely to prove, in the hands of a surgeon who practises all the departments of his art, and practises them all well, extremely few. 2. That those bad strictures, which are still worse being impermeable, should be cut in the old way, and that such strictures are likely to prove still fewer. 3. That all other strictures—and these constitute a vast and overwhelming majority of all strictures—should be treated by instrumentation (catheter or bougie) variously employed, without incision.—*Lancet, March* 22, 1851, *p.* 322.

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## 93.—NEW INSTRUMENTS FOR STRICTURE OF THE URETHRA.

By Thomas H. Wakley, Esq. Surgeon to the Royal Free Hospital.

[Mr. Wakley states that during five years which he has been connected with the Royal Free Hospital, in which some of the worst cases of stricture and retention of urine have been seen, he has never except in one instance failed of passing an instrument into the bladder. In three cases of perinæal incision which he has seen performed, two very speedily proved fatal. Time is required to prove which of the principles is most advantageous, that of simple dilatation of the urethra, or the division of it by the external or internal incisions. It is satisfactory to find, say Mr. Wakley, that the principle of the first method of treatment has received the approval of many eminent surgeons. The following is the description given by Mr. Wakely of the instruments he now employs in cases of obstinate stricture.]

No. 1, (*a.*) The catheter, thirteen inches in length, with the thumb-slide fixed, of a very small size, slightly curved at the extremity; the stem quite straight, and having at the end a worm, for the reception of the screw of the connecting rod.

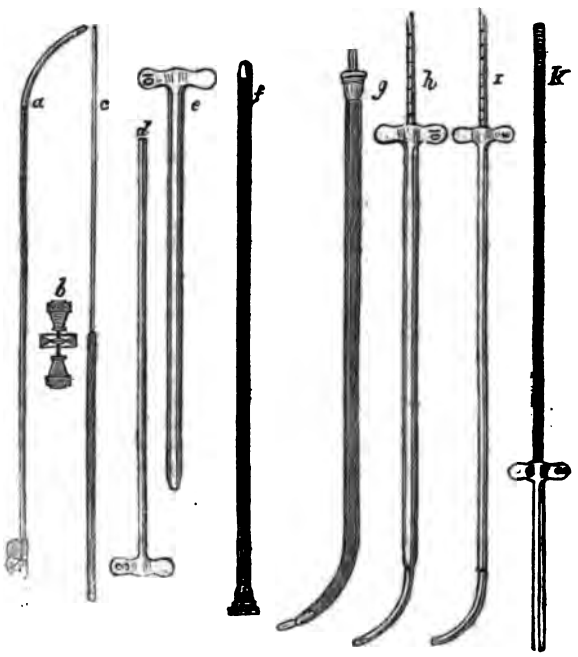
(*b.*) The small thumb-slide, (removeable at pleasure), screwing closely upon, and acting as a handle to, the catheter. The utility of this must be evident. The surgeon can guide the point of the catheter more truly. It is removed when the index-rod is screwed on.

(*c.*) Steel rod, which passes into the catheter as far as the screw, at which part both are united by two or three turns of the rod. The rod makes an addition of five inches to the length of the catheter. The rod and catheter comform the index-rod, or director for the silver and elastic tubes.

( ) Two silver straight tubes (Nos. 3 & 10); there are eight, of grad- the first is only one size larger than the index-rod, and the others in circumference, corresponding with the numbers of the ese tubes are nine inches long, are of a conical shape at s, and are so constructed as to fit, with extreme exact- he index-rod. They slide with the most perfect ease eing directed by it if the catheter be through the stric-

time, the tubes cannot take a wrong course or make a false passage, but must pass along the index-rod.

No. 1. No. 2.




(*f*.) An *elastic tube*, composed of a flexible metal, covered with elastic gum fabric. This combination gives to the instrument very considerable strength, without rendering it clumsy or bulky. The extremity of each of these flexible tubes has the same form as that of the silver tubes, and fits with perfect accuracy the surface of the index-rod. There are sizes of the elastic tubes corresponding with those of the silver tubes.

No. 2, *g*, exhibits an elastic metallic tube, (No. 7), running over *a*, the directing catheter, taking the curve of the catheter. Having introduced the elastic tube into the bladder, over the directing catheter, the latter is withdrawn, leaving the former in the bladder. *h* & *i* show the course of the silver tubes upon the directing rod. You have seen with what ease the tubes work over that guide. Upon the stem of the catheter you will observe a graduated quarter inch scale. This will always inform the surgeon at what part of the urethra the distal margin of the silver tube is passing over the directing-rod. The upper part of *h* & *i* shows a small portion of the steel rod, screwed into the catheter. *k* exhibits the upper part of *h* & *i*—viz., the steel rod, screwed into *a*, catheter, with *d*, silver tube, running over it; and having reached the turn of the catheter, indicates, by its position on the graduated scale, its arrival there.

I would now particularly enforce attention to the mode of applying the instruments which I have just shown and described, for the relief of permanent stricture of the urethra.

The catheter should be introduced with much caution and "lightness of hand," completely through the contracted part of the urethra into the bladder. This having been done, the stilet should be withdrawn, and the surgeon, satisfying himself, by the escape of urine, that the instrument is in the bladder, must then insert the smaller extremity of the steel rod into the catheter, and

having secured it by, making two or three turns of the screw, remove the thumb slide, and then pass No. 3 silver tube upon the index-rod right through the stricture or strictures. In performing this operation, the passage of the instrument will be much facilitated by giving to the flanges a rotatory motion as they are held between the fingers and thumb, and depressing the index-rod so as to straighten the urethra as much as possible. This tube being with, drawn, the others may all be passed in a similar manner, and in regular succession. The number to be introduced must of course be determined by the operator. After the last metallic tube has been withdrawn, an important object can still be secured—that of *keeping the command of the pervious urethra.* This is a point of considerable importance, and is accomplished with the greatest ease, by passing one of the *elastic tubes* over the index-rod, as was done in the case of the silver tubes. The flexible tube being in the bladder, *the index-rod is to be withdrawn through it;* this can be done with the most perfect ease and facility. The *flexible tube* may be left in the bladder, to serve the purpose of a catheter, and it will also afford a safe channel or guide for the *re-introduction* of the index-rod. One of the great advantages of these instruments is, that the catheter once having been passed through the strictured part, the command of the free urethra may then be retained. In practice this must always be found of incalculable advantage.—*Lancet, March* 22, 1851, *p.* 315.

[At the meeting of the Medical Society of London, on Saturday 18th Jan., 1851, Mr. Wakely submitted his instruments to the consideration of the Society.]

He remarked, that the subject of the treatment of stricture of the urethra had been much discussed within the last year or two, and had given rise to a great deal of controversy. It certainly was not a settled question what should be done in cases of severe permanent stricture. Mr. Syme, the distinguished surgeon of Edinburgh, had, as was known, recommended, where the ordinary means of treatment had failed, the division of such strictures by perinæal section. Probably, the instruments which he then had the honour of bringing before the notice of the Society would, in some cases at least, render such an operation unnecessary. He had used them in several cases already with very satisfactory results. The instruments he at first used were by no means of a refined or perfect manufacture, yet the advantages obtained were of a decided character. The instruments he now produced had been manufactured by Messrs. Weiss & Co., and as might be expected, they were very perfectly executed.

The society would not fail to perceive that the action of these instruments was safe and simple, and he had the pleasure of stating that the use of them had given him very great satisfaction. The application of the knife for the relief of stricture had been much condemned, although it had been strongly advocated by Mr. Syme, who was undoubtedly a high authority. Still he (Mr. Wakely) could not refrain from expressing a belief that there were strictures which might be removed by the instruments now before him, although Mr. Syme might consider that in such cases the perinæal section would be absolutely necessary to effect a cure. Time and experience in the trial of both plans would be required to enable a decision to be formed as to their merits. Mr. Syme had remarked, in a letter published that day, that he had endeavoured to establish two positions: "First. That the division of a stricture by that external incision, upon a grooved director, passed fairly through the contracted part, is an operation free from all ordinary sources of danger. Secondly. That, by this procedure, strictures which resist every other mode of treatment, and are apt to resent seriously even the gentlest use of simple bougies, may be speedily removed, so as to allow instruments of the largest size to be introduced without difficulty or inconvenience." The first proposition demanded particular attention, because he thought that the plan of treatment now proposed, by tubular expansion, would, in many cases of stricture contemplated by Mr. Syme, render the perinæal section unnecessary. If the grooved director mentioned by Mr. Syme could be "passed fairly through the contracted part," of course the small-sized catheter or index-rod now shown could also be guided through the stricture into the bladder. Necessarily, if the one instrument could be

passed so could the other; and the passage being thus secured, the tubes, both metallic and flexible, might be made to take the same course, without the slightest danger of making a false passage. In some obstinate and inveterate strictures he had succeeded in affording relief, almost without difficulty. Some of the strictures appeared to be of the worst possible form.—*Lancet*, *February* 1, 1851, *p.* 122.

[The instruments have been seen by Sir B. Brodie, Mr. Guthrie, Mr. Stanley, Mr. Fergusson, and other distinguished surgeons, who have approved of the principles of treatment which their use involves.]

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## 94.—PRACTICAL OBSERVATIONS ON THE TREATMENT OF PERMANENT STRICTURE OF THE URETHRA.

By Robert Wade, Esq.

[In a paper read by Mr. Wade he endeavours to place the potassa fusa in its true and legitimate position as a curative agent. After paying a well-merited compliment to the late Mr. Whately, as the first surgeon who used the caustic potash in stricture, he proceeds to show in what respect his plan differs from that of Mr. Whately. He says,]

The distance of the stricture from the external orifice of the urethra should be marked on the bougie, and a small piece of potassa fusa inserted into a hole made with the point of the instrument. He usually commenced with a piece of caustic, of the size of a common pin's head, and gradually increased to quantity if required. In old, hard, gristly strictures, the author found it necessary sometimes to use from half to three-quarters of a grain. The points of the caustic should be well covered with lard, and the instrument well oiled, before using it; the armed bougie should be gently pressed against the stricture for a minute or two, if impermeable, and then withdrawn. When there is a false passage, and the obstruction is beyond the straight part of the urethra, the author uses a curved canula for the application of caustic. When the caustic is applied to permeable obstructions, the bougie should be gently passed three or four times over the whole surface of the stricture. From its being miscible with oily substances, the potassa fusa might either be used as a mild stimulant, or as a powerful caustic. Potassa fusa, when efficiently used for the destruction of a stricture, appeared to exert its salutary effects by a process of inflammatory softening, and dissolution of the thickened tissue forming the obstruction. A sufficiently free application, to be efficient in old hard strictures, is usually followed by more or less of a slimy muco-purulent discharge, at first with an admixture of blood, but soon becoming of a dirty-white colour. The author did not, like Mr. Whately, use the potassa fusa in all cases indiscriminately, but only in such as did not yield to simple dilatation. He found that the caustic not only required to be used more freely than practised by Mr. Whately, but that it might be advantageously applied at shorter intervals than recommended by that gentleman. He believed that when used in the minute quantities employed by Mr. Whately, that the action of the caustic was simply that of allaying irritation, as when mixed with lard and oil, combined with the mucus of the urethra, it could scarcely have any effect beyond a mild solution of caustic, which probably caused a more healthy action of the lining membrane of the stricture. The cases in which the author had employed the potassa fusa advantageously were,—1st. Strictures of a cartilaginous hardness, and impervious to instruments. 2d. Strictures of long standing, which although admitting the passage of a small instrument, bleed more or less freely on its introduction. 3d. Irritable strictures. It will be seen by these observations that the author regards the minute quantities recommended by Mr. Whately as totally inefficient in many of the more aggravated forms of stricture. The author then briefly detailed the particulars of some exceedingly interesting cases in which he had employed the agent in question. These cases embraced illustrations of severe, irritable, and old, hard, gristly strictures which had resisted every means which had been previously resorted to by other surgeons. The good effects of the potassa fusa were strikingly illustrated in these cases.

[Alluding to Mr. Stafford's plan of division of strictures by the lancetted catheter, he states his opinion that it must be considered at the least as somewhat hazardous, and when this operation has proved so far successful that the bladder has been reached, it has often been found impossible to preserve the continuation of the advantage, the obstruction having recurred as bad as ever. With regard to Professor Syme's operation, he stated that it certainly was not always a safe one, and mentioned as a proof two published cases attended by fatal results.]

The author then alluded to the following conclusions from Mr. Syme's work on Stricture: "1. That division of a stricture by external incision is sufficient for the complete remedy of the disease in its worst form. 2. That in cases of less obstinacy, but still requiring the frequent use of the bougie, division is preferable to dilatation, as affording relief more speedily, permanently, and safely." (p. 58.) The author observed, that in some previous remarks upon this mode of treatment he had ventured to question the soundness of these conclusions, having expressed his doubts as to the new operation affording a permanent cure of stricture, for the following reasons:—1. That the thickened tissue is not removed by the knife in Mr. Syme's method, any more than in the one which had been commonly adopted in impermeable strictures. 2. That although a grooved director, in the new method, is passed into the bladder as a guide to the knife, yet the natural urethral membrane can form but a very small part of the enlarged passage, the greater part of this new channel being necessarily made through the condensed tissue at the seat of disease, The author then quoted the following passage from Mr. Syme's work: "It is now universally admitted that the bougie acts by exciting a degree of absorption of the thickened texture, which occasions the contraction and induration concerned in the formation of stricture. To produce this, the instrument should be employed with the utmost possible gentleness, and should not be allowed to remain in the urethra more than one or two seconds." The author, after observing that there was scarcely another surgeon at all experienced in the treatment of stricture who would not protest against such a frivolous use of the bougie, quoted the following passage from Mr. Hunter's work:—"The cure by dilatation is, I imagine, principally mechanical when performed by bougies, the powers of which in general are those of a wedge. However, the ultimate effect of them is not always so simple as that of a wedge upon inanimate matter, for pressure produces action of the animal powers, either to adapt the parts to their new position, or to recede by ulceration, which last is not so readily effected." The author went on to observe, that if a bougie was permitted to remain in the hard contractile strictures described by Mr. Syme but for one or two seconds, then, indeed, the knife must do the work which the bougie was not permitted to accomplish.

With regard to Mr. Syme's somewhat startling assertion, that there was really no impermeable stricture except from the awkardness of the surgeon, the author had only to observe, that cases of stricture occasionally occurred in this metropolis, in which surgeons of the highest rank not unfrequently failed in passing an instrument into the bladder. He could readily conceive it possible for Mr. Syme, with a very small grooved director or sound, gradually to find his way to the bladder; but it appeared to the author that such an instrument would be more likely to pass by the side of the obstruction, where there is least resistance, than through it.

Dilatation will probably effect a permanent cure of stricture in its early stage before the occurrence of much induration. That method, when properly conducted, will also prove successful in the relief or cure of a great majority of strictures, notwithstanding the existence of much gristly hardness at the seat of disease In such cases, however, there will be more or less tendency to re-contraction, for although the bougie may dilate the constricted channel to its healthy calibre, as indurated tissue is not easily removed by the absorbents, the obstruction will commonly return, unless prevented by an occasional introduction of instruments, the use of which may sometimes be necessary during the patient's lifetime. Caustic, when judiciously used, will often prove highly serviceable in facilitating dilatation; and in many cases, he knew that

the application of potassa fusa would be successful in the entire removal of the disease. It is, however, in the treatment of obstructions impermeable by instruments that, in his opinion, consists the indisputable value of the caustic alkali, as it had enabled him to succeed in the relief or cure of many cases, in which dilatation had failed, after long trial, in very skilful hands, and when the only hope held out to the patients was perinæal section—an operation which, he repeated, should never be performed whilst there remained a single chance of a successful result from less hazardous measures. He begged that these observations on perinæl section might not be misunderstood; for although he had used his best endeavours to dissuade surgeons from having recourse to its performance, except in the very few cases that cannot otherwise be more safely relieved, it had been far from his intention to say anything in disparagement of operative surgery, which, when ably and judiciously employed, amply merits, and will ever obtain, the admiration of all who can appreciate the untiring industry and high mental qualifications necessary to form the accomplished operator. By gentleness and perseverance, however, in the means which he had ventured to recommend, in bad cases of stricture, the surgeon may rest assured that he will generally be successful, without resorting to the knife.—*Lancet*, *February* 1, 1851, *p.* 123.

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## 95.—ON PARACENTESIS VESICÆ IN RETENTION OF URINE FROM STRICTURE OF THE URETHRA.

By Bransby P. Cooper, Esq., F. R. S.

Mr. Cooper in a clinical lecture delivered at Guy's Hospital, remarks, that although the operation of puncturing the bladder per rectum is recommended as the most simple and safe operation for the relief of retention of urine depending upon stricture of the urethral canal, yet its indiscriminate use would be highly prejudicial. He then proceeds to point out the cases in which he considers it ought, and in which it ought not, to be resorted to. He says,]

Surgeons admit three ways of performing the operation of paracentesis vesicæ, namely, puncturing above the tubes; puncturing through the rectum—or vagina in the female; and, lastly, cutting through the perinæum. Of these three, I shall exclude the first, as being, in my opinion, the most dangerous, the most liable to lead to the extravasation of urine, and the consequent formation of abscesses, and the most likely to be followed by injurious consequences, from the pressure of the canula on the coats of the posterior part of the bladder, when allowed to remain for some time, as is frequently requisite. If, then, this exclusion be just,—and, according to my experience, I hold it to be so,—it follows, that we have only a choice of one of two operations, and to one of these, a patient suffering under the distressing symptoms of retention of urine, with death inevitably staring him in the face, must submit for his relief; and it should be the surgeon's object and consideration, not only to pass an instrument into the bladder, and evacuate its contents; not only to direct his attention to the time being, but to reflect, and select that operation likely to produce most permanent advantage. And this will entirely depend on the condition of the constricted parts giving rise to the retention. If the stricture have existed for a long time,—if the walls of the urethra have become thickened and cartillaginous, so as permanently to constrict and destroy the function of the canal,—if, indeed, from the circumstances of the case, you believe the stricture likely to persist, although the patient be *pro tempore*, relieved of his retention,—I say, in such an instance, I recommend cutting through the perinæum. If, on the contrary, you have reason to believe, that, by alleviating his present symptoms, you may afterwards be able, by proper medical treatment, to overcome the stricture, then I advise the operation per rectum; so that your conduct must be guided by a consideration of the nature of the case you have to treat; and that operation which is adapted for the one, may, I hold, be highly prejudicial in the other. For I cannot agree with those surgeons who maintain, that if the source of irritation arising from the efforts at micturation be removed from the stricture, by substituting a new channel for the flow of the urine, that the amelioration of the obstruction will necessarily accrue: but, on the con-

trary, I am inclined to believe, that the cartillaginous stricture, or, indeed, in any kind in which the stricture of the urethra is much altered, will, so soon as the flow of urine is made to pass through another course, begin at once to form a permanent obliteration of the canal; as we invariably find that, under all circumstances in which an organ is thrown out of its natural function, that it soon begins to undergo a deteriorating process, which renders it incompetent to be restored to its natural use. This doctrine does not, however, hold with respect to sporadic spasmodic stricture, and therefore the palliative treatment of puncturing the bladder per rectum may, in such case, be most usefully had recourse to.

The operation of paracentesis per rectum is an exceedingly simple one, but on account of its simplicity, it is not, therefore, to be performed carelessly; for; if so, it might be followed by most serious consequences, if not loss of life. The most simple operation in surgery requires the exercise of care and judgment, and is never unattended with some amount of danger. In describing the operation, it will be necessary just to advert to, and bring to your recollection, the anatomical relation of the parts in the pelvic region.

You are fully aware the most important organs contained within the male pelvis are the urinary bladder and rectum, and that these organs in different positions of the body bear different relations to each other. The posterior surface of the bladder is entirely covered by peritoneum, the continuation of the layer descending on the anterior wall of the abdomen, which, being prolonged to the posterior portion of the base or fundus of the bladder, is reflected backwards to the anterior part of the rectum, thus forming a *cul de sac*, known as the recto-vesical pouch. In front of this reflected membrane, the base of the bladder comes closely in contact with the rectum, being separated only by fibro-cellular tissue and recto vesical fascia, a portion of the pelvic fascia which descends into the pelvis to retain its contained organs in place. The bladder here presents a triangular surface corresponding in its situation to the trigon in its interior, the apex of the triangle being directed forwards to the prostrate gland, and its sides bounded by the vasa deferentia and vesiculæ seminales. It is in this triangular space that the trocar and canula should be introduced, and where, it will be seen, it can be employed with scarcely any danger of wounding the peritoneum; for, as the bladder becomes distended in retention, it carries with it the peritoneum, thus placing it almost out of the reach of the instrument, and there will be little fear of injuring the vasa deferentia or vesiculæ seminales, if the point of the trocar be kept in a direction towards the median line. Bearing these considerations in mind, place your patient on a table, with his pelvis well raised before you, and in the same position as that required for the operation of lithotomy; then, introducing the index finger of the left hand into the rectum, pass along it the canula, furnished with a "pilot-plug," until it reach opposite the triangular space of the bladder which I have just described to you; withdrawing the pilot, and depressing the canula, until it assume the direction of a line with the umbilicus, pass in the trocar, and force the two onwards into the bladder. The operation is attended with but little pain, indeed, the chief pain is occasioned in endeavouring to introduce the canula without the "pilot-plug," an addition to the instument which is of great practical advantage; for, without it, the end of the canula seems to catch in the mucous membrane, and to produce such contraction of the bowel as to prevent its onward progress; with it, however, no such difficulty exists, for its smooth, rounded extremity readily passes within the rectum, and pilots the way for the canula. To insure success in the operation, the chief circumstance to be attended to is, in thrusting the trocar and canula forwards, to keep the point well elevated or the handle depressed; otherwise, it may pass between the bladder and rectum, and, on withdrawing the trocar, the operator may be extremely mortified to find no fluid following it.—*Med. Times, Feb.* 15, 1851, *p.* 168.

## 96.—RETENTION OF URINE IN A CHILD TWENTY MONTHS OLD FROM INJURY—PUNCTURE OF THE BLADDER ABOVE THE PUBIS—RAPID RECOVERY.

(Under the care of T. H. WAKLEY, Esq.)

[The ordinary cases of retention of urine are chiefly arising from obstinate strictures in adults, and have certain rules of treatment. But if it is produced from injury, the treatment must be determined by the circumstances of the case, and more especially so, if, as in this case, the patient is a child of tender years. Two days previously the child had fallen down an area, the perinæum coming in contact with the ground. On admission, the countenance is described as being full of anxiety, the limbs motionless, and the pulse 115 and weak. All the ordinary means to favour the introduction of the catheter were of no avail, and the instrument could not be passed.]

The child was now quite insensible; the respiration rapid and laboured; the pulse 125, very weak, and almost imperceptible. Mr. Wakley therefore considered that no more time should be lost in attempts to render the urethra pervious, and determined to puncture the bladder above the pubis. A glance at the situation of the child will show that the pubic operation was almost the only one which could be selected. As there was no stricture, there existed, of course, no distended membranous portion of urethra which could conveniently be punctured, and as for the rectum, the "soft mass at the commencement of the prostrate gland," which stopped the catheter, was no encouragement to resorting to the rectal operation.

Mr. Wakly, therefore, punctured the bladder over the pubis in the usual manner, assisted by Mr. ROBERTSON: a very considerable quantity of high-coloured offensive urine was drawn off, and the canula kept in its place by a bandage running round the waist. The sequel will show that leaving the canula in the wound was not productive of any inconvenience, but, on the contrary, followed by the best results. The elastic catheter is recommended by some surgeons, but the urine has been known to pass between it and the wound, and excite inflammation in the peritonæum. A large poultice was placed over the abdomen and peritonæum, and the child carefully placed in bed.

In the evening the little patient became conscious and restless for two or three hours, but he soon fell asleep, and slept nearly the whole night. The canula was kept in the bladder for three days, and the urine drawn off at intervals. After this period a catheter was easily introduced into the bladder, and the canula being now no longer required, was withdrawn. The wound healed very rapidly, the urine continued to flow through the urethra, and in eight days the child left the hospital.—*Lancet, Nov.* 23, 1850, *p.* 580.

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## 97. CASE OF PROSTATIC AND VESICAL CALCULI—LITHOTOMY—UNUSUAL POSITION OF ONE OF THE CALCULI.

[Under the care of J. ERICHSEN, Esq., Surgeon to the University College Hospital.—Reported by HENRY THOMPSON, Esq., House Surgeon.]

[The patient, W. W., aged twenty-three, was admitted on the 2d of October, 1850. On examining the urethra with a sound, some rough hard substance was discovered in the prostatic part of the urethra, with here and there concretions, one being apparently as high up as the fundus, and fixed. On being injected with warm water the bladder was found incapable of holding more than three or four ounces, and on further examination a calculus was found which appeared to lie high up, distant, and towards the right side, and to be of considerable size. The urine was found pale, straw coloured, clear, faintly ammoniacal, specific gravity 1017, little pale deposit: under microscope, many crystals of tribasic phosphates: few pus and granular corpuscles; albumen not large, but more than the presence of pus would account for. Mr. Erichsen decided upon operating, and on the]

9th.—The bowels having been cleared by a brisk purgative, an enema was given at noon. *Operation.*—Two p.m.: Chloroform having been given in the ward, the patient was brought into the operating theatre. Four ounces of warm water were thrown into the bladder, and the staff was introduced. The

stone, however, could not be discovered with this instrument; it was therefore withdrawn, and a sound passed. By careful searching, and depressing its handle, the stone could be felt, apparently above and behind the pubes. The sound was now removed, and the staff introduced. Mr. Erichsen then stated that he expected to meet with considerable difficulty in the extraction of the stone owing to its unusual position, as shown by the way in which it was necessary to carry up the point of the sound round the pubes to find it.

The patient being bound, a free external incision was made in the usual situation, and the urethra and bladder were opened by a limited internal incision. On introducing his finger, Mr. Erichsen felt two or three small calculous masses at the bottom of the bladder, and removed them with the forceps, but he could not reach any large stone thus. On passing the forceps, however, nearly perpendicularly upwards behind the pubes, the lower end of the stone could be felt, and was grasped, but the forceps slipped repeatedly, it being impossible to get a firm hold of the calculus, the lower end of which only could be felt, and which appeared to be lodged in a kind of pouch, being firmly embraced by the contracted bladder. The operator then directed an assistant to press firmly on the abdominal parietes above the pubes, so as to bring the stone more within reach; this was done when, by means of the curved scoop, worked round it, between it and the side of the bladder, it was brought down, and at length extracted by the forceps, but broken into three or four pieces. The bladder was then injected with warm water, a tube introduced, and the patient put to bed.—Eight P.M.: He is still somewhat under the effects of the chloroform, being drowsy and incoherent; pulse 108, very weak; tongue dry; urine passes freely by the tube.

[On the evening of the 20th no urine passed the tube, and he was found evidently sinking; the tube was removed from the wound: the pulse gradually grew weaker, and at four the following morning he died. There were two interesting and important features in this case, viz., the absence during life of any prominent symptoms indicating the extensive disorganization of the kidneys which was found after death, and the peculiar position of the stone in the bladder. With regard to the latter, Mr. Thompson remarks:]

There are some cases on record, in which, notwithstanding that the bladder has been dexterously entered, and carefully explored, the patient has been sent away from the operating-table with the stone unremoved, still free within the viscus, *i. e.*, not encysted. It is by no means improbable that many of these have had for their cause a condition of things similar to that described in the case before us. The concretion becomes either temporarily or permanently lodged in the upper fundus, behind the pubes, and thus eludes the grasp of the forceps. And the origin of this seems indicated in the history given above. There had been incontinence for nine months previous to his admission—consequently there was, as far as the retaining of urine is concerned, absolute loss of function by the upper portion of the bladder; it may therefore contract, and become fitted to form a kind of pouch for any concretion which may get there. Once lodged, it is not difficult to conceive how its rough external surface may attach it closely to the mucous membrane in contact. With the stone in such a position, it is clear that the forceps will at first not discover it; they must pass in a direction almost at right angles with the axis of the incision, greatly increasing the difficulties of manipulation, and then, probably, will rather force the stone up behind the pubes than grasp it between their blades. Ascertaining this to be the situation of the calculus in the present instance, Mr. Erichsen directed pressure to be made immediately above the pubes, and succeeded, by this manœuvre, in accomplishing its extraction, with the aid of a curved scoop.

This, however, is not the first time in which such treatment of the difficulty has been successfully adopted. Two somewhat similar cases are reported in the 'Medical Gazette' for August 15, 1845, as having occurred in the practice of the late Mr. Aston Key. It is there said of them, that "the attempt to extract the stone would have been abortive, had not he (Mr. Key) directed pressure to be made above the pubes, so as to bring the calculus within the grasp of the forceps. The handles of the forceps, though depressed as much

as the wound would allow, could not carry the blades high enough to reach the stone, and it required very firm pressure on the lower part of the abdomen to depress the stone sufficiently to enable the forceps to seize it. As soon as firm pressure was made, the stone could be felt to descend between the blades of the forceps." Again,—"It is in the retreat of the stone before the forceps that the difficulty of seizing it lies: the stone, instead of retreating in a direct line from the opening into the bladder, ascends behind the pubes, where the forceps cannot, without assistance, reach it, much less grasp it."

Of these two cases, the present report forms an excellent illustration. Taken together, they are most valuable, as affording a solution to one of the many difficulties which the lithotomist may be called upon at any time to encounter. The utility of making abdominal pressure under the circumstances described is not alluded to in any systematic work on the subject; nor has there been any recommendation or report of it, that I am aware of, excepting the one above quoted, and it is on this account that special attention has been called to it, and its importance referred to in the foregoing remarks.—*Lancet, November* 23, 1850, *p.* 575.

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## 98.—LITHOTRITY.

By Charles Hawkins, Esq.

[At a meeting of the Pathological Society of London, Mr. Hawkins made the following observations on some very interesting preparations before the Society, illustrating a very important point of practice, with regard to the operation of lithotrity:—]

It had fallen to his lot to see the operation of lithotrity performed in private practice several hundred times, and in the course of this experience he had only seen this accident occur four times. In two the fatal result (as shown by the preparations now before the Society) had been averted by the timely cutting down on and removing the impacted stone, and by thus making an external opening into the urethra, avoiding all the unfortunate results of a piece of stone lodging in a lacerated portion of that canal, such as infiltration of urine and abscess, certain results of such an accident, if no external opening be made, and the piece of stone remaining in the urethra. But he believed this accident might be entirely avoided, if the operation of crushing be performed with the lithotrite,—that is, if the operator is satisfied with crushing the stone and not attempting to withdraw the fragments between the beaks of the instrument. He believed this accident never occurred except where the urethra had been lacerated with a piece of stone, during the withdrawal of the instrument; then impaction of a fragment led to the results which the preparations exhibit, but where the urethra has not been lacerated, impaction is of little importance, and no dangerous symptoms are likely to result from such an occurrence. At least this was the result of his experience. Since no attempts have been made to remove fragments from the bladder in the instrument, he had met with no such accident. Impaction, when the urethra is not lacerated, does occasionally occur, but with care all danger may be avoided. He had removed as much as half a wine glassful of detritus by means of a small silver scoop, without any difficulty, in a late case under his care. He had been obliged to remove a large portion of the stone by this means; indeed, so easy was it, that this patient uses the instrument himself in the same manner.

He believed that the result, as shown by the preparation, was merely the result of the urethra having been lacerated, and stones becoming impacted in some rents, and not that the laceration of the urethra was caused by the stone becoming impacted. He had never seen any danger arise where there had been no bleeding from the urethra following the operation. As far as his experience went, it was not necessary to attempt the removal of the stone in the scoop—lithotrite. If the stone is *well crushed* it may be left to nature for the bladder to be evacuated of the fragments, or where there was a difficulty in passing them, he had removed much by means of washing out the bladder. This accident had never occurred in his own hands. Abscesses will form in

the neighbourhood of the bladder after lithotrity, where there has been no *impaction*, or laceration, nor the least injury of the bladder or urethra.—*Med. Gazette, Jan.* 3, 1851, *p.* 29.

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## 99.—HYDROCELE.

(From the Clinical Reports). By Professor SYME.

The operation for hydrocele, practised here, is, I think, fairly entitled to the character of perfection in regard to simplicity, facility, and efficiency. It is executed by injecting a teaspoonful of the tincture of iodine, by means of a common sixpenny pewter syringe, which answers the purpose not only as well, but, in my opinion, much better than the expensive and fragile toy that would be put in your hands, if you were to seek the assistance of a London instrument-maker. To appreciate the advantages of this most simple procedure, you should be acquainted with the newest fashion of Parisian practice, promulgated about six weeks ago, not by any obscure or doubtful authority, but by the medical inspector-general of the French army, surgeon of the great hospital of the Val de Grâce—M. Baudens.

This distinguished gentleman begins the process by preparing his patient, through means of suitable diet, baths, and purgation. He then employes a sort of pasteboard telescope, and candle, to ascertain the position of the testicle, and next punctures the hydrocele with a lancet, to let a sufficient quantity of fluid escape for rendering the bag so flaccid that a portion of it may be compressed between the operator's finger and thumb. Through this he thrusts the trocar, bringing its point fairly out on the side opposite to that on which it enters. He then takes out the trocar, and leaves the canula, which, having a hole in its side, allows the remaining fluid to escape. The canula being secured in its place, air is blown into the cavity of the tunica vaginalis, and retained by a plug. This process is repeated three or four times, with the interval of as many hours. Next day, another series of injections of water takes place,—each being preceded by an insufflation of air, to clear the passage. On the day following, a third course of the same kind is executed, with the difference of wine, or a solution of nitrate of silver, being the agent employed; and so on until the requisite degree of excitement is induced. In one case, gravely related by the author, air, water, wine, and nitrate of silver, were injected during the first four days, and an injection of tincture of iodine, in the ordinary way, on the fifth, at which period the patients treated here are usually dismissed from further restraint. If this proposal were merely puerile and absurd, or useless and inexpedient, it would hardly deserve notice; but being, as I believe, not free from the danger of serious consequences, if applied to the irritable systems of patients treated in private practice, it merits, in my opinion, the most unqualified condemnation. You should beware of supposing that that which is newest is also the best, and may see, from what I have just stated, that deference to mere date or name is an unsound foundation for professional opinions. It used to be thought essential for the completion of medical education, that a season should be spent in Paris. I am not sure how far an abstract desire of professional information may have always led to the representations for this purpose, but think it right to tell you, in order that your present opportunities may not be mis-spent, what sort of improvements you are to expect, in the event of going abroad in search of them.—*Monthly Journal of Med. Science, March*, 1851, *p.* 291.

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## 100.—TREATMENT OF PRURITUS OF THE GENITAL ANAL AND AXILLARY REGIONS.

By Dr. TOURNIE.

[By the general term pruritus, prurigo, lichen, or eczema are often confounded in the cutaneous affection, the itching being nothing more than a symptom, and after existing without any other characters, without constituting a true disease, this unpleasant affection may, in nervous people, sometimes determine consecutive symptoms of manifest importance. The most successful

results obtained by Dr. Tournie have been from the following plan of treatment.]

1. An ointment of calomel, in the proportion of from four to six parts of calomel to thirty of axunge. 2. A powder, composed of four-fifths of starch and one-fifth of camphor, well pulverised and mixed. We may, however, in the ointment, increase the proportion of proto-chloride of mercury; and, in the powder, the dose of camphor, according to the obstinacy of the disease.

The mode of application is as follows:—If the diseased parts are covered with scales or dry crusts, as in eczema, then separation is promoted by cataplasms and emolient baths; having accomplished which, he applies, twice a-day, frictions with the foregoing ointment, and after the frictions, sprinkles the parts with the mixture of starch and camphor.

The ointment alone is inefficacious; and the camphorated starch, without the assistance of the ointment, allays the itch, but does not effect a cure. Experience has proved this.

The following are the cases of which he has reported the details:—1. Prurigo of the labia majora and vulva—intertrigo. 2. Lichenoid affection of the labia majora—intertrigo. 3. Chronic eczema of the scrotum. 4. Lichen in axillary region. 5. Itching of anus. 6. Ditto, do. Besides these, he notices three other cases of perfect cure by this treatment, two of lichenoid affections of the anus in men, and one of prurigo of the labia majora in a woman. He does not give the details of these last three cases. In one only—namely, that of the fourth case—was it necessary to increase, in a notable manner, the doses of the calomel and camphor; in all the other cases, the ordinary formula was sufficient to produce a cure.

When the itching of the anus is caused by the presence of ascarides, the calomel and camphor are less efficacious; but he has recourse in this case to mercurial ointment, and often verified its vermicide effects on this species of worm.

The state of pregnancy seems to neutralize the action of the therapeutic means, the success of which he has recorded above. Thus the itching of the genitals in two pregnant females proved intractable to every kind of treatment. In one only venesection seemed to allay the itchiness a little; but in the second it produced no effect;—in both, the itching disappeared immediately after delivery. In these two cases the itching had commenced during pregnancy; and it existed without giving the vulva any appearance of a lichenoid or pruriginous eruption.

Dr. Maslieurat-Lagémard has published, in the 12th No. of the "Gazette Médicale," for 1848, page 204, a very curious and remarkable account of a general itching supervening, without eruption, in the course of eight pregnancies, in one of his patients. This did not commence till after the sixth month, and no treatment appeared to alleviate the violent itchings, which during the eight pregnancies resulted six times in premature deliveries.

In Dr. T.'s hands the combination of calomel ointment with the powder of camphorated starch, in the treatment of itching of the hemorrhoidal region, has given results which no other treatment has ever obtained in so constant a manner.

Every practitioner who has been consulted for these affections has been obliged to direct himself to formulæ of great variety, before hitting on a successful expedient. In illustration of this, it is sufficient to relate the summary of five observations published by Dr. Ruan, in 'Hufeland's Journal.'

Of these five cases, two were treated without any success by purgatives, diuretics, opium in large doses, Goulard's extract, and solution of borate of soda; intractable to all these means, they were cured by the balsam of copaiba.

In a third case, the copaiba, which had succeeded in the two first, was inefficacious, whilst the borax, which had failed in the others, caused the itching to disappear in this case.

A fourth case resisted the divers means employed for the three first, and gave way to the administration of the subcarbonate of soda in small and repeated doses.

The fifth case resisted every treatment.—*L'Union Medicale.—Monthly Journal of Med. Science, April*, 1851, *p*, 373.

## SYPHILITIC AFFECTIONS.

### 101.—ON SYPHILIS.

By Bransby B. Cooper, Esq., F.R.S.

[Though the following remarks may not have attached to them any peculiar amount of interest, they are at least useful and instructive as affording us examples of cases which we have to encounter in private practice. Speaking of the definition of the stages of this disease, Mr. Cooper remarks:]

If I might be allowed to express my own opinion on the subject, I would give the following definition of the three stages or forms of syphilis: Primary symptoms—the chancre or local affection; secondary syphilis—the sore throat and the various cutaneous eruptions; and tertiary—the ulcers and sores which succeed the eruptions, and which, like them, are the result of the constitutional manifestation of the disease.

The diagnosis of a primary syphilitic sore or chancre is sometimes exceedingly difficult: in fact, taking the physical characters of the ulcer alone, it is frequently impossible to distinguish it from one of a non-specific nature,—frequently out of the surgeon's power to say with decision and confidence this is venereal, or that is not. If, then, gentlemen, we can go into our wards, and in one patient pronounce with certainty, and without the least hesitation, his sore to be specific; and in another, be unable to give a decided opinion either way, or to point out any definite characters why it should or should not be considered venereal,—I say, if such be the case, the appearances that primary sores assume must be very varied and indefinite, and as yet latent to our discriminating powers: and so they are. What, then, does this variety, this difference in external appearance, result from? Does it depend on a variety of the syphilitic poison itself? No. There is but one true poison of syphilis, which poison produces different effects, depending on the nature of the tissue affected, and on the peculiarity of the constitution; and I believe, that all the different effects, and all the varieties of sores, depend on one and the same morbific cause, the action of which is modified by the particular state or disposition of the individual in which the symptoms are developed. From this it is that syphilis, notwithstanding the attention that has been devoted to it by so many distinguished and able men, yet remains one of the most obscure and difficult subjects that the surgeon has to encounter.

With regard to the treatment of primary symptoms we possess, happily, a remedial agent—mercury, which might be considered to have almost a specific influence over the disease, and I believe that syphilis cannot be thoroughly eradicated from the system by any other medicine, after absorption has taken place and it has become a constitutional affection. If, however, you have a patient come to you within four days after the appearance of a chancre,—that is, before the syphilitic poison has had time to become absorbed, and implanted in the system, no matter if the sore be of the callous or true Hunterian description, or however ambiguous its characters, by the application of concentrated nitric acid you would effectually decompose or destroy, and render inert the specific poison. By these means, and these means alone, I feel confident you would extirpate the disease, and at once cut short its further progress. I have now had several cases, in which I have adopted this treatment; and, as far as I know and have a right to believe, in each it was attended with success. Four of the patients I have seen since, and I know they have had no re-appearance of the disease; whilst the others I have lost sight of, but I have no doubt should have heard of them again had it not proved successful.

After the venereal poison has had time to become absorbed, and to be diffused through the system, the surgeon has two objects in view: one to procure a resolution of the local inflammatory action, and promote the healing of the sore: the other to subdue and annihilate the disease in the system, and prevent its recurrence under a secondary form. This I think is most effectually, I may say only effectually and securely, to be accomplished by treating the chancre through the constitution alone, and submitting the patient to a course of mercury, employed with caution and discretion. I do not mean, however, to deny,

that a syphilitic sore—a genuine chancre—will subside and heal up under other, and under even simple local treatment. I say, I not only do not dispute it, but am convinced of its truth. But, at the same time, I do not consider the disease eradicated, nor do I consider the patient secure from the development of secondary or tertiary symptoms.

The healing of a chancre, by the application of local means, is no proof of the constitutional subsidence of the disease. If, then, a chancre will heal under the influence of topical agents whilst the disease still exists in the system, we have it explained how it is that secondary symptoms afterwards appear, although mercury has been given in the treatment of the primary disease; for local remedies are almost always at the same time enjoined. It is here lies the secret, in ensuring security to your patient from a recurrence of the disorder, and a solution of the difficulty experienced in determining when an efficient quantity of this powerful but invaluable medicine has been exhibited, to attain the object in view, and in knowing when to stop with safety and security from all further and future appearance of symptoms. I therefore depend solely on the constitutional employment of mercury, and object to the use of black wash and similar applications, which are in themselves capable of removing the sore, and thus destroy the index which its appearance forms when its reparation is effected, only as a result of the constitutional eradication of the disease. The healing of the sore under these indications is an evidence that the system has been sufficiently mercurialized; and that its use may now be confidently abandoned. Acting under this prineiple and conviction, the plan I in almost all cases pursue, is to apply a simple piece of moist linen—not lint, for I have seen it (whether from the chlorine used in bleaching it, or what, I do not know) excite such irritation round a chancre, as almost to produce balanitis, which all quickly subsided on the use of linen instead of lint to the sore, and administer internally gr. v. of blue pill with 1-4 gr. opium at bedtime, and v. gr. of blue pill alone in the morning; directing these pills to be made up separately, and labelled respectively "night" and "morning" pills. I tell the patient, if his bowels become constipated, to take only the morning pills both night and morning; if, on the contrary, relaxed, to take only the night pills. With this variation in treatment, according to the circumstances of the case, I continue the mercury until the sore has disappeared, and the hardness of its base subsided. I learned this treatment from my uncle, Sir Astley Cooper, and have adopted it in almost every case that has come before me during the last thirty years; and I have never yet once got into a difficulty with it, from the re-appearanee of the disease under secondary symptoms. Trust to mercury, but give it cautiously, give it judiciously, watching your patient during its administration, and seeing that he avoid all possible exposure to cold, and if possible keep him within doors. The remedy itself is a poison, and, if improperly employed, might inflict as much or more injury on the patient than the disease it was intended to cure.

Secondary symptoms are manifested in various morbid phenomena of different parts, more especially of the skin, mucous membranes, and bones. Affections of the latter, I believe, are not the result of syphilis alone, as a specific disease, but of its action, modified by the influence of mercury, which, as far as I can learn, in such cases has always been previously administered; and I consider syphilis of itself, I will not go so far as to say incapable, but certainly not as yet proved to have the power of producing such direful morbid conditions of the osseous system. I have had an opportunity of witnessing cases of syphilis, that have proceeded for a long time uninfluenced by any remedial agent, in sailors engaged in the merchant service, who, having contracted the disease, have gone to sea, where they remained for some months in a vessel with no surgeon on board. In these cases the disease has gone on as an ulcerative process; the chancre has spread, there has been ulceration of the groin inside the thighs, and over the pubes, but not an indication of the affection of the bones.

With regard to the treatment of secondary syphilis, the iodide of potassium is the remedy held in most repute, and the one that in general produces the most immediate beneficial and successful results. But, according to my expe-

rience, iodide of potassium and iodine, although they have the power of arresting or suspending the disease *pro tem.*, are incapable of eradicating or eliminating it *in toto* from the system, and securing the individual from subsequent attacks. Sir Astley used almost invariably to prescribe the bichloride of mercury, in doses of 1-16 gr., taken in bark or sarsaparilla, two or three times a day; and I myself prefer and recommend mercury to be given. It is true, its remedial effects are not so speedy as those of iodide of potassium; but this is more than compensated for by their being of a more permanent character. Cases sometimes occur where iodide of potassium has been administered for some time, and the further continuance of its use increases instead of diminishes the symptoms it was intended to relieve. In such instances, I have sometimes seen the most marked effects accrue from small doses of arsenic, especially when combined with mercury and iodine, in the form of the liquor arsenici et hydrargyri hydriodatis, or Donovan's solution.

[It was clear in the case before them that the mercurial treatment was abandoned before the symptoms thoroughly yielded. After this he was iodised and mercurialised frequently, but with no ultimate benefit. Had he been a strong man, Mr. Cooper said he would have given him mercury and used every precaution. But being of a depraved constitution and weak, he ordered him,]

℞. Iodinii, gr. ss.; potassii iodidi, ʒss; syrupi papavaris, ʒss; infusi gentianæ co., ʒx.; misce, ut fiat mistura, cujus sumantur, cochl. ij. magna ter die, cum morphiæ acet: gr. ss. omni nocte.

I pursued this for a few weeks, and at the same time enjoined perfect rest in bed, but found little or no improvement in the sore; which, as is the character of the specific kind, healed in one part, but extended itself in another. At the same time, a number of tubercles appeared over his head and face, which are anything but a favourable indication of the condition of his system. Tubercles and blotches—the difference between the two being, that the former are elevated, but the latter even with the surface of the skin—may depend on other causes than syphilis; but, as a result of this disease, they are always unmistakable from their coppery hue, their smutty or dirty appearance, the skin in fact conveying the impression of its wanting to be washed. It might be asked, why is it, if the whole system be impregnated alike with a poison which is circulating in it, that we do not have a universal eruption or sore, for it follows that all parts of the body must be equally under its influence? I do not see that this can be explained otherwise than by saying, that it must arise from some weakness or exciting cause in the part affected, which does not exist elsewhere. Seeing that he made no progress under the influence of the medicines prescribed, I altered them, and gave him—R. Liq. hydriodatis arsenici et hydr., ʒjs.; extracti sarzæ, ʒj.; dec. sarzæ co., ʒviij.; cochl. ij., amp. ter die sum.; pulv. opii. gr. ss. omni nocte. And since then, I must say, he has been slightly improving. The sore has a more healthy appearance, and does not seem extending, and the tubercles on his face are apparently subsiding and dying away. But I am not sanguine of his speedy recovery, and know that it must be a work of time before it can be effected, if ever he gets well again.

In concluding these remarks on syphilis, I may observe, that in sloughing phagedæna, mercury has the effect of aggravating rather than mitigating the symptoms, and is consequently decidedly prejudicial; the remedies are the topical application of nitric acid, and the internal administration of opium. Nitric acid not only destroys the part in contact with it, but at the same time induces a more healthy action in those beneath.—*Med. Times, Jan.* 18, 1851, *p.* 55.

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## 102.—ULCER IN THE GROIN—SYPHILITIC?—CONSTITUTIONAL TREATMENT—CURED BY MERCURY—CONSERVATIVE INFLUENCE OF THE LYMPHATIC GLANDS.

By John Hilton, Esq., F.R.S., Surgeon to Guy's Hospital.

[The ulcer in this case occurred in the person of a gas-pipe layer, who six months before admission, struck his shin against a gas-pipe, and soon after discovered a swelling on his left groin; this gradually increased in size, and

ultimately broke, discharging no fluid; presenting the appearance of a crack or fissure, which gradually increased in size. He was ordered Plummer's pill and extract of henbane, five grains each, every night, and the solution of the bichloride of mercury one drachm, with the decoction of sarsaparilla, three times a day: yellow wash to be applied to the part. Three weeks from this date we find his gums have been affected for two days, and the ulcer is much smaller and has a much healthier aspect. This case shows us how a disease may continue for a long period uninfluenced by any local plan of treatment, it being kept up by a constitutional taint in the system, which when recognized, readily yields to the exhibition of constitutional remedies. One would naturally, on seeing an ulcer in the groin, suspect syphilis as its cause, but in the present instance the man denied its previous existence strenuously, and attributed it solely to the blow on the shin. If we regard the original wound in the leg as the exciting cause of the ulcer, it must have been by producing absorbent inflammation, which extended to the lymphatic glands in the groin, with which the absorbents of the leg directly communicate. By the term absorbent inflammation, we mean an inflammatory condition of the lymphatic or absorbent vessels, depending upon the presence in them of an irritating fluid, which extend to the nearest lymphatic gland by means of their continuous tubular arrangement.]

Now these enlarged glands, with which the absorbents communicate, must be regarded *as the result of a highly conservative act*, in reference to the constitution or general health, by tending to arrest the progress of the morbid fluid on its way to the blood, so as to prevent its entering into the general circulation and poisoning the whole system: the poisonous and morbid influence being exerted upon the glands themselves, gives rise to inflammation and abscess of the surrounding tissues. This wise provision must be regarded as a means of arresting the rapid extension of malignant disease through the system: thus, for instance, in malignant disease of the hand, or arm, or breast, when it has existed for some length of time, we find that the axillary glands become enlarged,—a conservative act, tending to prevent the passage of the malignant cells into the general circulation; for if these morbid cells were permitted to mingle with the blood, so as to be carried floating in it to the centre of the circulation, they would be liable in their passage through the minute circulation of the lungs to become there arrested, and either to engender, as it were, a like disease in surrounding structures, or form a nidus for a malignant growth, which increasing in size by the development of new cells, gives rise to a disease of a similar nature to the original morbid growth, but which now assumes a more serious aspect from occurring in an organ where its rapid growth interferes with important functions, and leads consequently much sooner to a fatal termination. Morbid fluids and products, however, are not only propagated through the medium of the lymphatics, but also by the veins, which is attended with far more danger to the patient, and is more speedily fatal. But you will perhaps ask, why this should be followed by a more dangerous result than when the poison is taken up by the lymphatics? The reason is this:—In the veins there essentially is no conservative apparatus like that we have been speaking of in the lymphatic glands; consequently there is nothing to retard the free passage of the morbid fluid from the original source into the general circulation, or to prevent its immediate mixture with the blood; the blood speedily becomes poisoned or inoculated by it, giving rise to phlebitis or inflammation of the venous tubes, leading to consecutive inflammation and suppuration in other parts of the body, and attended with that extreme constitutional depression so common in these cases. There is, however, a kind of conservative action in the veins, which is this: when during the progress of ulceration, pus enters a vein, the blood may become immediately coagulated, and obstruct the vessel, by forming a plug, thus preventing the passage of the pus with the blood towards the right side of the heart; but if, however, the quantity of pus is not sufficient to produce coagulation of the blood, this conservative influence is lost; the pus becomes mingled with the blood, and passes into the larger veins; is carried into the heart; and either becomes arrested in the capillary circulation of the lungs, or else in the course

of the aortic circulation is lodged in the systemic capillaries; and thus gives rise to abscesses in different parts of the body.

Having explained to you how a lymphatic gland may inflame, suppurate, and ulcerate, in consequence of morbid fluids being carried to it by the direct tubular communication of the absorbent vessels between it and the seat of injury, we now come to consider the precise character of the ulcer in the case before us—to endeavour to arrive at a proper conclusion with reference to the mode of treatment to be adopted; the ulcer discharged an ichorous fluid, its edges were hardened, raised, irregular and inflamed,: there was also hardness of the integuments around. Could it be of a malignant nature? There was no evidence of this. The general aspect of the ulcer was decidedly non-malignant, neither was it attended with that lancinating or shooting pain so frequently met with in cases of this class of disease.

Again: was it a common ulcer, deriving its peculiar appearance from being modified by a constitutional cause, such as a syphilitic taint? The history was strongly against any complication of this sort; for although repeatedly questioned, the patient always strenuously denied ever having such a disease. But can this assertion be relied on? We know that cases are frequently coming under observation in which, judging from the character of the ulcer alone, no doubt can be entertained respecting its specific origin, and yet patients will protest against it to the last, even although our diagnosis may have derived additional strength and confirmation from such an ulcer yielding only to a mercurial plan of treatment.

It is important to remember that simple wounds occasionally assume a specific character when occurring in persons whose constitution has been previously poisoned by syphilis.

Instances are occasionally met with in practice of specific or syphilitic ulcers in the groin or any other part, presenting highly characteristic features without any existing evidence of a primary sore, amenable to appropriate remedies, and curable only by specific treatment.—*Med. Gazette, February* 28, 1851, *p.* 353.

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## 103.—ON SYPHILITIC ERUPTIONS.

By Thomas Hunt, Esq.

[Speaking of the alterative treatment of syphilitic eruptions, Mr. Hunt observes:]

Every mineral used in medicine has some peculiarity of action, which can only be understood by long and attentive observation; and without a familiarity with these habitudes, we use the medicine at great disadvantage. Too much attention cannot be given to this subject. In order to show its important bearing, the action of mercury may be contrasted with that of arsenic. Thus:—

| Arsenic. | Mercury. |
|---|---|
| Produces its maximum of good by slow degrees, and by continued and prolonged exhibition. | Effects its salutary purposes often suddenly; always within a limited period; or, beyond that period fails altogether. |
| Has a cumulative action, the system becoming more and more sensitive to its presence, and intolerant of its influence, in proportion to the quantity swallowed. | Has no cumulative effects after the first few days: and the system becomes less and less sensible of its presence, and more tolerant of its influence, by its habitual use. |
| May be given until the patient will not bear the five-hundredth part of a grain. | May be given until enormous quantities prove absolutely inert. |
| Affects the nervous system more readily at first, and afterwards the vascular system, the nervous tissues recovering their tone. | Affects the vascular system more readily at first, the nervous system suffering severely after a lengthened course. |

| | |
|---|---|
| Should therefore be added to the blood drop by drop, *acute et gradatim*, in diminishing doses. | Should be poured in suddenly, until it produces some effect, then as suddenly withheld for a time, and resumed if necessary with greater energy. |

That the vascular system may be gradually inured to the influence of mercury, so that doses which at first had the power of salivating, may at length be administered without producing any sensible effect: and that, in order to excite as ready an action by a second or third course of mercury, as by the first, the dose must be increased, if not doubled, must be well known to every practitioner. It is also matter of common observation, that the salutary action of mercury on diseased structure, is nearly contemporaneous with the morbid action of the mineral on the gums or other tissues. Accordingly, the common practice has been, not only to make the gums sore, but to keep them sore for days or weeks together, with a view to the continued and protracted effects of the remedy on the disease. As it was once believed that copious ptyalism was necessary to ensure the full benefit of the mercurial treatment, so of late it has been generally held, that a continued though moderate, degree of soreness of the gums is a necessary condition. This opinion appears, however, to rest upon no better foundation than the former now long exploded notion.

Both the one practice and the other appear to be founded on the belief, that the morbid action of the mineral on the healthy tissues, takes precedence of its salutary action on the diseased structure. Many years' close and anxious observation have established in my mind the opinion, that this is an erroneous view. It is not easy to detect, in an ulcer or an eruption, the first appearances of healthy action; and it is clear that healthy action must exist for some little time before it becomes apparent. If, therefore, the gums first become tender, and the ulcer first presents an improved appearance, on one and the same day, it is fair to presume that the healthy action had been actually set up on the previous day, that is, antecedently to the morbid action on the gums. But further, close observation will generally reveal the fact, that the very appearance of improvement in the diseased parts exists before the gums are in any degree affected. The mercury has effected the good before it has affected the evil. The soreness of the gums, therefore, is a sign, not merely that the mercury has been pushed far enough, but that it has been pushed *farther than was necessary* for the establishment of healthy action in the diseased parts.

If a drachm of strong mercurial ointment has been used every night for five successive nights, and if, on the following day, healthy action is substituted for diseased; and if, on the sixth night, the inunction is continued, the gums becoming slightly sore on the following day,—in such a case as this, the mercury has been continued two nights longer than was necessary: for the healthy action, which became apparent after the fifth night, must have existed the day before, though unobserved; consequently disease had been actually arrested by the fourth inunction; and the healthy action thus set up, would doubtless have continued, for a time at least, if the mercury had been omitted on the fifth and following nights.

The injury inflicted on the gums, therefore, was wholly unnecessary to the immediate restoration of health. The effect has been sudden and perhaps instantaneous,—but will it be lasting? Probably not; and the practical question is: Would the effect have been rendered in any degree, more permanent or satisfactory, by persevering in the mercury? It is now pretty well agreed, that no advantage would have resulted from salivation; for sores which had become healthy at the commencement of the mercurial course, have been but too frequently observed to retrograde under a protracted ptyalism. And the same thing has been observed under a mild but long-continued course, affecting the gums but slightly.

Under the mercurial irritation in any and every degree (whether from the consequent exhaustion of the *vis vitæ*, or from whatsoever cause), the latent virus, if any exists in the system, is liable to break out in an aggravated and destructive form. It is, therefore, not only useless, but in some degree danger-

ous, to persist in the use of mercury for a single day beyond the date of a visible improvement in the disease. It is, however, often necessary to have recourse to a second course, or even a third or fourth, in order to effect the final destruction of the disease. Each succeeding course must be more energetic than its predecessor; otherwise little or no effect will be produced. The courses should also be short and distinct, and should be so managed as to arrest disease without disturbing the general health. The case should be watched *day by day*, and an improvement in the disease, ever so slight, be it real and satisfactory, should be regarded as the signal for arresting the course. Then aperients and tonics should be substituted for the mercury: and the very first appearance of a return of the disease indicates the necessity of a renewed administration of mercury in doses twice as large as the first. By this means disease may often be arrested in an incredibly short time; and when the system is again purged from the mercury, a third course may be administered as a preventive, suspending the mineral as soon as fetor is observable in the breath, or a bitter metallic taste complained of by the patient.

The whole of this practice, which has proved very generally successful, is founded upon the fact, that the action of mercury upon the disease is sudden, and of short duration. It is that of a shock; and the impulse appears to be expended upon the organic nerves. In what way such an action on these nerves can permanently destroy a blood disease, it may not be easy to explain; but that the final results are not compromised by the limited duration of the mercurial action is quite certain. Indeed, the radical cure of this disease never proves so difficult as where mercury has been administered in large doses for many consecutive months. The debility thus produced too often renders the system a helpless victim to the disease. Whereas, by short and vigorous courses, the vital powers are roused and invigorated, the appetite is increased, the digestive organs become active, sleep is procured, and the disease appears to yield rather to the *vis medicatrix naturæ* than to any specific antisyphilitic virtues inherent in the mineral.

These views may appear opposed to the experience of many practical men, who, failing to effect a radical cure of syphilis by a short course of mercury, have seen the disease annihilated at length by a persevering use of the remedy, for many weeks together, to the severe injury of the gums. Such cases occurred in large numbers in the early part of my practice; and it was once my opinion, that the benefit was due to the unremitting use of mercury. More recent experience, however, has made it evident, that the disease would have yielded quite as fully to a shorter course, and that the benefit derived from the continuous use of mercury, was all due to the shock produced at the commencement of the course.

A very powerful, yet incidental, illustration of the principles above enumerated, has been furnished by a recent publication from the pen of Mr. Langston Parker. This gentleman has found that by a process of fumigation, the beneficial effects of mercury may be secured with more certainty and less inconvenience than by the usual methods. The advantage is evidently derived from the rapidity of absorption and consequent suddenness of effect. Mr. Parker's practice must, of course, be limited by its attendant inconveniencies; but the principle is capable of almost universal appliance. We have had long experience of its value in the use of mercurial inhalation. The fumes of the oxides of mercury received into the fauces have been found to produce the specific effects of the medicine when the system has been proof against inunction. But it is easy to apply the principle to any mode of introducing mercury into the system, which it may be found convenient to adopt.

[There is a possibility of severely salivating a patient by an unguarded exhibition of a few energetic doses of mercury. This is to be avoided by administering an experimental course to ascertain exactly the degree of mercurial susceptibility in the constitution of each patient. Strumous subjects are apt to bear mercury ill; preparations of iron must be combined with the mineral, and the patient must be given the advantage of the coast, the open air, and a mild season, when the difficulty is often overcome.]

Much importance is attached by some practitioners to the selection of the

medicinal preparations of mercury; some giving the preference to one form or mode of introduction, others to another. Without depreciating the real value of these preferences, it may be questioned whether any general rule can be laid down. Every preparation has its objections as well as its advantages; but both the one and the other are casual, not inherent. The chloride is active and energetic, and invaluable in cases of iritis, where there is no time to be lost; but it is apt to create undue irritation in the bowels. Inunction is a safe and, generally, a sure mode of introduction. But it is a dirty and inconvenient practice; and now and then we meet with cases in which the absorbents of the skin refuse to perform their office: neither can we in any case ascertain how much mercury is actually absorbed.

The blue pill is a mild and convenient form for the first course; yet it is liable to remain unchanged and inert in the bowels, or, on the other hand, to be converted into the chloride or bichloride. The latter preparation is often active and useful, but it fails in safe doses to create the salutary shock so necessary to the full effect of mercury on the system. Fumigation, either general or local, presents perhaps more advantages, when it can be conveniently had recourse to, than any other mode,—but it is a difficult and delicate question, how to regulate the dose. It is my usual practice to begin the course with two or three grains of blue pill every night for three nights, by way of experiment. If this produces no effect, an aperient is administered, and after it, five or seven grains of blue pill night and morning, until its salutary effect becomes visible. In the second course, the dose is increased; in the third, inunction is preferred; in the fourth, inunction, together with frequent doses of calomel, with or without opium. In strumous cases, the bichloride, combined with the compound tincture of cinchona for adults, and the grey powder for children, with some preparation of iron, have been found most useful.

In all cases, regard must be had, not only to the original constitution of the patient, but to his present condition. Both plethora and anæmia are conditions highly unfavorable to the advantageous exhibition of mercury. In the former case, depletion must precede the mercurial course: in the latter, the preparations of iron may be combined with mercury, or otherwise administered.—*London Journal of Medicine, March*, 1851, *p.* 240.

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## 104.—TREATMENT OF GONORRHŒA BY CHLORIDE OF ZINC INJECTIONS.

By E. A. Lloyd, Esq., Surgeon to St. Bartholomew's Hospital.

[In the patient, in the first case related by Mr. Lloyd, all the symptoms of gonorrhœa were present in an aggravated form; copious yellow discharge from the urethra, with pouting or protrusion of the lips of the orifice; glans penis, prepuce, and in some degree the entire penis red and swollen; slight uneasiness in the inguinal and pubic regions as well as in perinæo; pain in erections, and great scalding on micturition.]

Case 1.—The patient was about fifty years of age, and stated that he had come to consult me under very disagreeable circumstances, for he was a married man, and had a severe gonorrhœa upon him. He added, that I must cure him before the arrival of his wife, whom he expected from the country in the course of a week. I considered this a good opportunity of testing the efficacy of the chloride, and I was led to make the experiment from having observed, in many diseases in which I had used it, the rapidity with which it would sometimes subdue and change morbid action. I considered, also, from the affinity of the salt for albumen and gelatine, that it might act beneficially on the secerning vessels. From previous experience as to the effects of the medicine on mucous surfaces, I thought that the urethra, even in its greatly inflamed state, would bear a lotion containing one grain of chloride to one ounce of water. This lotion I therefore prescribed, with directions that a very small syringeful should be gently injected every six or eight hours. The penis and perinæum were to be frequently bathed with tepid water, and I likewise prescribed the following medicines:—Rochelle salt, six drachms; heavy magnesia, one drachm and a half; antimonial wine, four drachms; syrup of marsh

mallow, four drachms: gum mixture, one ounce, and six ounces of water. The sixth part of the mixture to be taken three times a day. I added two pills composed of two grains of calomel, ten of extract of jallap, and one drop of pimento oil, to be taken immediately, and repeated every other night. The patient was to come to me the next day. In the morning he presented himself, saying that he was much better; he had used the injection four times, and since the third there had been no appearance of matter from the urethra, nothing coming away but a slight watery discharge. I examined him, and found this to be the case. The inflammation of the penis had likewise subsided, but there was pain and tension in the perinæum, and uneasiness in passing urine. I directed that he should repeat the pills immediately, persevere with the mixture, have a warm bath at 98 deg. as soon as possible, and bathe the perinæum frequently with comfortably warm water. The next day the symptoms had very much diminished; there was no return of discharge, and before the end of the week all was well; and this, I believe, proved, on the arrival of the lady, a good cure, no return of the disease having occurred. You will be pleased to notice that the injection was continued the whole time.

Case 2.—Another married man consulted me on account of gonorrhœa which had existed for a week; the symptoms were nearly as in the former case, and the same treatment was pursued. The chloride-of-zinc lotion was commenced on Dec. 5, and in four days' time the disease was cured.

Case 3.—Charles Sims, an hospital patient, came under my care December 5, and stated that he had had gonorrhœa for two months. From the nature of the discharge, and the inflammation of the parts, it appeared that he had contracted a fresh disease. He was subjected to the same treatment as the former patients, and on the 12th of December he was quite cured.

Case 4.—Morris Green, also an hospital patient, came under my care on Dec. 4, on account of bad gonorrhœa, which he had had for three weeks. He was subjected to the same treatment as was employed in the former cases, and on the 11th of December he was quite well. At the expiration of three days all purulent discharge had ceased.

Case 5.—Mr. G., a married man of plethoric habit, consulted me on Feb. 25, on account of a gonorrhœa, contracted seven days before. There was a copious purulent discharge, great ardor urinæ and chordee. The saline treatment, with antimony and warm baths, and the lotion of chloride of zinc, were prescribed. After the third using of the lotion, the discharge had almost ceased, there remaining nothing but a slight serous secretion. On the 28th of February, the only vestige of the disease that remained was slight tumescence of the orifice of the urethra.

It would be only a tedious repetition to adduce more cases of this kind; it will be a more profitable employment of time, particularly as I have now but a few moments to spare, to consider some other circumstances relative to the employment of the chloride-of-zinc lotion in gonorrhœa.

I have often used it in cases in which the inflammation of contiguous structures has co-existed with the gonorrhœa to a great extent, and a beneficial result has generally followed; and I have never observed any ill consequences from such procedure. I have several times employed it when hernia humoralis was existing at the same time in a most acute form; and I have likewise so used it this year, in the hospital, in several cases with decided benefit, the gonorrhœa having been cured, and the hernia humoralis being recovered from, rather more quickly than otherwise. In all such cases, I use pretty active depletory measures at the commencement of the disease, and administer sometimes the tartar emetic, in grain doses, every three or four hours, till the acute stage of the inflammation is gone by. I have also employed the same remedy with marked and almost immediate benefit in cases of gonorrhœal ophthalmia, both in children and in the adult; and I have also injected the cavity of the uterus with the same lotion, in some cases of long-continued purulent discharge, with speedy relief; and this in cases which had resisted all the mere common remedies. I seldom use more than one grain to the ounce of water in recent cases of gonorrhœa, but in some cases I go as far as three grains.

I do not intend to state that the chloride of zinc will cure every case of gon-

orrhœa, but when employed in the early stage, it has proved in my hands more successful than any other remedy I ever employed. In cases of long standing, I have not found it equally efficacious, and it has often failed. Before concluding, I would caution you not to allow too large a quantity of the lotion to be thrown into the urethra at once: a small syringe, half full, and used very gently, is better than to inject large quantities. I would further urge upon you not to employ the lotion without combining it with the antiphlogistic remedies.—*Lancet, December* 28, 1850, *p.* 669.

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105.—BORAX AS AN APPLICATION TO GANGRENOUS BUBOES.

At the meeting of the Physiological and Pathological section of the Medical Society of Vienna on June 18, 1850, Dr. EFFENBERGER stated that he had applied a solution of borax, in the proportion of from one to two drachms in a pint of water, to a large number of patients who suffered from gangrenous bubo, with great success. He had fifty cases in one year; not one had died, although there were several very severe cases, and in one the femoral vessels were laid bare. The solution was applied by means of charpie, so as to cover the edges of the sore. It was very essential that the charpie should be very frequently renewed by night and day; and to the neglect of this precaution, he attributed the failure of this practice in the hands of other surgeons.—*London Journal of Med., April*, 1851, *p.* 375.

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## AFFECTIONS OF THE EYE AND EAR.

106.—NEW SCISSARS FOR THE REMOVAL OF FALSE MEMBRANES FROM THE EYE.

By W. R. WILDE, Esq., Surgeon to St. Mark's Ophthalmic Hospital, Dublin.

[Mr. Wilde has recently invented a very simple and beautiful instrument for the removal of opaque capsules and false membranes from the chambers of the eye, which he describes as follows.]

Every person who has performed many operations for cataract must be aware of the difficulty there is in removing from the eye, or pressing out of the field of vision, a piece of opaque capsule or a scrap of false membrane. The causes which produce these obstructions to vision, and the appearances which they present, are so well known to ophthalmic surgeons as not to require description here. Frequently the piece of opaque capsule is held behind or within the pupil by a delicately-fine cobweb-like membrane, of a light grey colour, but sometimes transparent, which is generally attached to the ciliary processes, or to the back of the iris. Notwithstanding its tenuity, this membrane is very tough; and, although one can make large rents in it with a cataract needle, particularly that with a fine cutting edge, such as I am in the habit of using, it is very difficult to cut a piece of it across, and the narrower the strip the greater the difficulty. One can pass the needle behind, and bring the offending body forward even to the back of the cornea, or press it backwards into the vitreous humour, to any reasonable depth; but still, it will not give way, and a manifest drag appearing in the ciliary attachment of the iris if we continue the process, warns us to desist. Sometimes the piece of capsule itself occupies the position of the membrane which I have now described. If by any means one end of the opaque body can be detached, the subsequent difficulties are much lessened. An opening may then be made in the cornea opposite the point where the opaque body is still adherent to the back of the iris, the aqueous fluid partially evacuated, and then, as the offending substance falls forward towards the wound in the cornea, it may be hooked out, or drawn through with Dalrymple's forceps or the little instrument which I described for the purpose some years ago, (see Ophthalmic Report in the 'Dublin Quarterly Journal,' for 1848. Vol. V., p. 501,) and then removed with a fine scissars. Care should be taken that no portion of the capsule, or the membrane to which it is attached to the iris, remain in the wound. The lids may be closed, and the case treated like one of an ordinary extraction, except that we must keep the pupil dilated while the

aqueous fluid is re-secreted. This operation is the one I have been in the habit of performing in cases such as the above: but, as I have already remarked, it is chiefly applicable to instances where the capsule remains like a leaf attached to its stalk. To think of depressing it from out of the field of vision is almost futile, its peduncle is highly elastic, and it springs back into its former position the moment we relieve it from the pressure of the needle.

The first grand point I conceive, in such cases, is to detach the capsule or its surrounding membrane at one extremity so as to leave it attached by only one end: but this is a very difficult matter. The ordinary iris-scissars requires too large an opening in the cornea to work with freedom. I have, therefore, taken advantage of the principle of the very beautiful instrument lately invented by M. Charrière, the celebrated cutler of Paris,—and described in the 'Annuaire de Médecin et de Chirurgie' for the present year and styled by Dr. Desmarres, a Serretelé—to construct a pair of scissars that will occupy less space than any other yet invented, cut with greater certainty, and that can with greater facility be introduced either through the cornea or sclerotica. The capsule-forceps described in the 'Annuaire,' being likewise made in London, by Mr. Weiss, and now in the hands of every ophthalmic surgeon, is already so well known as not to require a minute description of its beautiful mechanism here, and the accompanying illustration will explain my meaning more perfectly than words. To the end of a fine double canula is attached a small but strong brass spiral spring which runs down through a hollow ivory handle of the usual length of most eye instruments, and fixed at the end by a ball nut. C. By means of the finger-spring B the long canula is pressed forward through the short one or collar, which is attached by means of the small thumb-screw A to a metal plate at the end of the handle. The scissars part, D, consists of a fine steel stem an inch and three quarters long, and not so thick as an ordinary darning needle, the end of which is cleft and each extremity beautifully formed into the blade of a fine pair of *shears*, scarcely a line and a half long. My idea was, that the instrument should cut like the ordinary shears used in sheep-shearing or wool manufactory, in which a spring keeps the blades apart, and they are brought together by the action of the hand. The instrument maker has beautifully carried out my conception, and, by giving a slight inward curve or *wind*, as it is technically termed, to each blade, like the scissars invented by Dr. Wollaston, and also so setting the fork of this part of the instrument, that the blades would cross each other on the wrong side if closed, and when not regulated; they, when properly adjusted, and placed within the canula, cut with the greatest certainty and precision. The various parts of the instrument having been put together up to this point, the blade-stem, D, is passed down through the oval canula, with the flat of the blades on the plane of the spring and screw, until they begin to be closed by the pressure of the canula. The scissars or shear blades must then be set with the fingers, (and this will require some delicate and dexterous management) so as to close and cross each other in the proper direction, and the stem is then run down the canula to the requisite depth, when the thumb-screw, A, which also fixes the collar in which the canula moves, is to be screwed home, and the blade-stem fixed thereby. The requisite degree of elasticity to draw back the canula can be given by adjusting the nut at C.

When the instrument is about to be used, the spring B being pressed down to the handle by the middle finger, the long canula is projected through the collar, and the blades of the scissars closed with that very clipping motion,

which is most requisite: and the spring B being relaxed, the coil within the handle brings back the canula, and allows the blades of the scissars to divaricate. When the canula is pressed forward, and the blades of the scissars closed, they form a fine needle-like point, as shown at E. Figure F, is a key to fix and screw up the spring B. No scissars that I have ever met cuts with the same degree of sharpness and accuracy: and I have no doubt that this will shortly be rendered much finer, so as to occupy scarcely more space than a cataract needle. It is intended to be introduced either through the sclerotic or cornea, according to the most advantageous position for dividing the portion of capsule or false membrane. When introduced through the cornea, an opening should first be made for it with a flat needle or the point of an extraction knife. Possibly this instrument or some modification of it may be useful in performing the operation for artificial pupil, or in detaching portions of the iris from the back of the cornea, &c. I have been induced by M. Charrière, to give this early notice of the instrument, otherwise I should have waited until I had had practical experience of its value and working.—*Med. Times. Dec.* 7, 1850, *p.* 592.

## 107.—ON SPECKS AND OPACITIES OF THE CORNEA.

(From the Medical Report of the Edinburgh Eye Infirmary). By Dr. Robert Hamilton, and Benjamin Bell, Esq.

A knowledge of the minute anatomy of this structure, is most useful in guiding our prognosis, as well as sometimes regulating our treatment, in those numerous and vexatious cases so well known under the general appellation of opacities of the cornea. Regarding these cases, the experience of the past year has strongly impressed upon our notice the decided improvement which has often taken place upon specks on the cornea, when treated with gently stimulating applications, such as the solution of nitrate of silver. Under the continued use of this agent, and other gentle excitants, many of those depositions which, we feared, had seriously compromised distinct vision for life, have slowly, but entirely disappeared;—a result attributable, undoubtedly, mainly to nature's work, but probably somewhat assisted by the persevering use of the resources of art. The rationale of the process, and of the amount of its salutary agency, as well explained by Mr. Bowman, seem to be, that the proper laminated tissue, is capable of enlarging its vascular resources for its support under disease, and for the subsequent removal of diseased products to such an extent, that, if it has itself escaped disorganization, it is able under favourable circumstances, completely to resume its transparency.—*Monthly Journal of Medical Science, April*, 1851, *p.* 388.

## 108.—GONORRHŒAL OPHTHALMIA.

(From the Medical Report of the Edinburgh Eye Infirmary.)

Three cases of gonorrhœal ophthalmia have come under treatment, all of them marked with the urgent and violent character so striking in this disorder. In all of them one eye only was implicated. We attach very considerable importance, in this class of cases, to the early use of free radiating incisions of the sclerotic portion of the conjunctiva, which, it is alleged, when in a state of intense chemosis, strangulates the vessels going to the cornea, and superinduces thereby its sudden sloughing and mortification. Be that as it may, this practice was had recourse to in our cases. In one, the cornea got off scathless, in another, it quite recovered, after considerable ulceration of its superior circumference; in the third, occurring in a young man in the height of vital power, but who did not come into the infirmary for several days after his attack, when sloughing had already commenced, the cornea was seriously compromised, and the vision nearly lost.—*Monthly Journal of Medical Science, April.* 1851, *p.* 389.

## 109.—CONCENTRATED SOLUTION OF TANNIN IN AFFECTIONS OF THE EYES.

By M. Hairion.

In all formularies there are to be found collyria and injections of tannin, but in all these prescriptions the solution is weak, being about one or two parts to 120 of water. There is, therefore, nothing new in the employment of tannin as a collyrium. The peculiarity of M. Hairion's practice consists in the strength of the preparations which he employs; thus his ordinary solution is one part of tannin to three of distilled water; sometimes he employs it in fine powder, or in ointment, or in the form of a thick magma. He has used it in chronic and acute conjunctivitis, "vegetating granulations," corneitis with and without ulceration, chemosis, and pannus; and it is in this last affection that he has met with most success from its use, a complete cure having been effected in some cases very rapidly. In "vesicular granulations" he has had less success, especially when they are at their height. M. Hairion, after a very enthusiastic laudation of its utility, states that he has never met with any occurrences which could lead him to regret having used these large doses; it has never caused the least inflammatory reaction; it has never produced any caustic effect, nor given rise to indelible incrustations; and, moreover, its application is not painful to the patient.—*Archieves de Med. Belges, in Journ. de Pharmacie*, Dec. 1850.

[M. Hairion's strong solution of tannin is probably safe enough, and may answer well in some instances; we have used it in the proportion of one part to eight in chronic corneitis, with apparent advantage; but our experience of it is too limited to entitle us yet to pronounce on its value. We fear that our author's partiality to it leads him very much to exaggerate its utility. Ed. M. J.]—*Monthly Journal of Medical Science, Feb.*, 1851, *p.* 192.

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## 110.—NOTICE OF THE TREATMENT OF CERTAIN CASES OF ENTROPION BY MEANS OF COLLODION.

[Under the care of Wm. Bowman, Esq., F.R.S.]—Reported by J. Cummin Toshach, Esq.

[The following notice of this remedy will we think be considered justifiable, when it is known that it has been used as a substitute in a variety of instances, for the somewhat severe operations frequently necessary for the relief of persons afflicted with this troublesome affection. The cases occurred at the Royal London Ophthalmic Hospital, Moorfields.]

The most frequent cases of entropion are those affecting the lower lid in elderly persons suffering from ophthalmia. The spasm of the orbicularis, the forcible squeezing together of the lids, occasions an inversion of the lower one, owing to the relaxation of the integument. The inversion having once taken place, tends immediately and directly to aggravate the ophthalmia and the irritability of the organ, and thus to perpetuate and increase the entropion. If the inversion is slight, the margin of the lid is turned against the globe, and the lashes lie flat upon the sclerotica and cornea, rubbing the conjunctiva, but often with less irritation than might be expected, and always with less than is occasioned by that inversion or displacement of the cilia in which their free ends are pointedly turned against the eyeball. If the inversion be still greater, the ciliary border is turned completely over, so that the cilia are bent under and are received as it were against the mucous surface of the lid, in the sulcus which always exists along the lid in consequence of its being rolled inwards upon itself. In this position they give less pain. But in both conditions they constitute a serious source of discomfort, and prevent the cure of the ophthalmia. If allowed to remain for any length of time, they often lead to opacities of the cornea and other secondary disorders.

In this form of entropion an operation has commonly been required, and that now commonly resorted to, consists in removing a horizontally elliptical piece of the integument close to the ciliary border, and closing the gap by fine sutures. Other modes of fulfilling the same indications have been adopted with more or less success, and when patients have been unwilling to submit to any of them, the best substitute, and that a most inefficient one, in many cases, has been the

fixing the lid in place by means of adhesive plaster, which is often difficult of retention, and always unsightly.

The following cases, which are among those that have been treated by Mr. Bowman, will show that the collodion, properly applied, affords not merely temporary but permanent relief in this variety of entropion.

Case I. J. P., æt. 61, female, presented herself at the hospital, for what she called a cold in the left eye, which had existed twelve or fourteen days, and for the relief of which she had been under treatment at another hospital, where she had given her some eye-water. After attending several times without benefit she applied here. On examining the eye, Mr. Bowman found that the ophthalmia was dependent on an entropion of the lower lid, it being just sufficiently inverted for the cilia with their convex surfaces to rub against the ocular conjunctiva. Mr. Bowman, on turning his attention to the right eye, observed that there was in this eye also an entropion, but without much accompanying ophthalmia: the inversion in this eye being complete, the cilia were not rubbing against and irritating the conjunctiva, but were lodged in a longitudinal sulcus extending the whole length of the lid, and corresponding to the attached border of the tarsal cartilage.

For the relief of the ophthalmia in the left eye, collodion was applied to the lower lid, in the manner and with the precautions to be presently mentioned. It was also applied to the right lower lid, to restore it to its natural position, No other remedies were employed. She left with directions not to rub the collodion off; and in two days afterwards the patient came with the ophthalmia in the left eye quite well, and no inversion. On the right side the tendency to inversion was much diminished, and the collodion was applied again. This application was successful. Case II. J. L., æt. 70, an old man, was to have an artificial pupil made in his right eye. On presenting himself for operation, it was found that there was an entropion of the lower lid, and considerable concomitant opthalmia. In this state of things, it was impossible to think of proceeding with the artificial pupil. Collodion was therefore applied to the lower lid, and the patient, living some distance out of town, was told to return in a week, which he did; when the ophthalmia had entirely ceased, and the entropion was no longer present. After being in the hospital two or three days, the artificial pupil was made, without any undue inflammation following the operation. In this case, had the collodion not been used, it would have been requisite to have removed a portion of skin, as in the ordinary operation for entropion, previously to attempting to make a new pupil; but by a very simple means, surgical interference was obviated, and a painful proceeding, often submitted to with reluctance, was rendered unnecessary.

In the following case it failed through the neglect of the patient to have it replaced at the proper time.

Case III. R. M., æt. 70, had had entropion of the right lower lid for six weeks, with ophthalmia, when the collodion was applied on the 24th March, 1850. On the 4th April it still adhered effectively, and the inversion was prevented. He did not come again till the 18th April, when the collodion had been displaced several days, and the entropion had returned. It was then replaced, and also on the 2d and 9th of May; and for the time gave complete relief. After this he stayed away three weeks, during which the entropion returned under a fresh attack of ophthalmia; and as there was no prospect of his being able to come at more frequent intervals, to have the treatment efficiently carried out, Mr. Bowman recommended him to submit to the removal of a piece of the integument in the ordinary way, to which he readily consented, and by which he was cured.

There are other cases of entropion, the result of aggravated or long continued ophthalmia, with much photophobia and lacrymation. The following examples will show that these also are amenable to the collodion treatment.

Case IV. S. L., æt. 39, female, states that five months prior to applying to this hospital (January 20, 1851), her eyes became suddenly bad; that she had been under treatment all that time without any benefit. The right eye was the worst, in which she states there had been an inversion of the lower lid since the commencement. She has at present great intolerance, and profuse

lacrymation. There is an opacity covering the upper part of the cornea of the right eye. When she first presented herself she was ordered a blister behind the right ear, and some lead lotion. On the 27th, collodion was applied to the right lower lid. On the 30th, she came back, with the collodion displaced and the entropion restored; but the collodion was reapplied on that day, and on three occasions afterwards, at intervals of three days; when, on the 10th of February, she is much improved; and on the 25th of March she comes with the entropion cured, the opacity of the cornea alone remaining. From the 27th of January she had been taking gr. j of quinine twice a day.

In the application of collodion for the relief of entropion, certain precautions are to be observed; otherwise it may fail in its intended effect.

1st. The collodion itself should not be too dilute. It should be thick and syrupy; in short, it should be concentrated.

2d. Care should be taken that the surface on which it is to be applied is properly *dry*, and free from any moisture: therefore it is always necessary to wipe the surface before application; otherwise it will not adhere with any degree of firmness, but will soon fall off. With attention to the above caution, it adheres very firmly. There are, however, many cases in which the outer surface of the inverted lid is excoriated by constant wetting by the tears; in which it is desirable to delay the application till this worst state is relieved. A few days are usually sufficient for this purpose.

3d. During the application, and while evaporation is going on, the position of the head should be attended to. The vapour may irritate the conjunctiva, and as light increase in the flow of tears takes place. To prevent these flowing on to the collodion at the time of its application, it is necessary that the head be inclined to one side, so that the tears may drop from one corner of the eye, and not run over the lid and cheek.

It does not seem very important how much of the integument is covered by the collodion, so long as the contraction is sufficient to remedy the inversion; and the best way to judge of this, is to bring the lid into place, and to raise the skin from the cheek towards the tarsal border, before commencing the application of the collodion. It is necessary to apply it close up to the ciliary border, in order to produce the contraction along that border. If this be done, it is less essential to smear it far down towards the cheek. Where the integument is very lax, a very considerable surface of it may be covered.

With these precautions in view, the application is proceeded with as follows. The lid being restored to its natural position, it is held there while the collodion is being applied, by making gentle traction outwards on the integument below the outer canthus. In this way the skin of the lower lid is horizontally grooved, while at the same time it is left exposed, so as to be free to receive the colodion. It should be held in this way till the collodion has contracted at least to such a degree as may be sufficient to maintain the right position of the lid during the further stages of the contraction. Very often one application of the collodion is sufficient to cure an entropion; but if a tendency to return manifests itself, it must be repeated at intervals of three or four days or a week.

It must be remembered that the collodion is not proposed as a cure for every case of entropion. In those forms which depend on contracted cicatrices or a distorted cartilage, when the tarsal edges may be irregular or much thickened, the ordinary modes of cure by operation must still be resorted to, but confining the treatment by collodion to those forms which are recent and uncomplicated with serious structural change, it will be found that it is an invaluable means of remedying a great and troublesome deformity.—*London Journal of Medicine, April*, 1851, *p.* 383.

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## 111.—ADVANTAGE OF NEUTRAL-TINT GLASSES.

By Gilbert Mackmurdo, Esq., F. R. S., Surgeon to the Royal London Ophthalmic Hospital, &c.

Neutral-tint glasses are preferable to any others for the defending delicate eyes against an excess of light of any kind; for, as Mr. White Cooper has remarked in his excellent little book, from which I have, this evening taken

several facts, it is well known that if a person's eye has been subjected to any particular coloured light, and he subsequently looks upon an object of a white colour, he will at first form a wrong judgment as to the colour, and he will not call the object white, neither will he suppose it to be the exact colour which he had previously looked at, but will conceive it to be of another tint, which in optics is termed the complementary colour. I have marked on the diagram-board the colours, and their complementary ones. The board was thus marked:—

| *Colours.* | *Complementary Colours.* |
|---|---|
| Red | Bluish-green. |
| Orange | Blue. |
| Yellow | Indigo. |
| Green | Violet-red. |
| Blue | Orange-red. |
| Indigo | Orange-yellow. |
| Violet | Yellow-green. |
| Black | White. |
| White | Black. |

Thus, if a person looks through blue glasses for a short time, the retina is less sensible to blue light; and therefore, when they are removed, if a piece of white paper is looked at, it will appear orange-red, because the observer sees only that colour which arises from the combination of all the rays in the white light which it reflects, with the exception of the blue. So also green would excite a violet-red spectrum.

Thus, then, any cause which would diminish the sensitiveness of the retina, as any particular colour would, should be avoided. The neutral-tint glasses, seem to defend the eye *from all colours equally*, and produce, under sunshine, the effect of a cloudy day.—*Lancet, April* 12, 1851, *p.* 402.

[Neutral-tint glasses may be quite correct for *day-light*, when the *relative proportions* of the rays of light require no alteration, but they are certainly worse than useless—they are positively injurious as a medium for gas-light, or any other artificial light. The *quantity* only of daylight requires to be diminished in some cases, and in these the neutral-tint is sufficient, and, indeed, perhaps the best. But the *quality* of artificial light requires to be changed. Day-light is composed of a great predominance of *blue* rays, artificial light of *red* rays. In the last therefore the red requires modifying with admixture of blue, which is done by *blue* glasses, a pure colour, and quite different from the neutral glasses, because neutral colour has a great quantity of *red* in its composition, the very colour we want to get rid of.—Ed. Ret.

## 112.—NEW REMEDY FOR SHORT-SIGHTEDNESS.

By Dr. A. Turnbull.

[Dr. Turnbull states, that observing short-sighted persons partially close their eyelids when looking at distant objects, his attention was directed to the iris, which in such cases he found generally much dilated, the contraction of the iris necessarily increasing the length of vision by permitting the rays of light only to enter in a straight line. He conceived that if he could discover some remedy to affect this contraction, one cause of the defect of short-sightedness would be overcome.]

In the first instance, says Dr. Turnbull, I applied the extract of ginger, which was rubbed for five or ten minutes over the whole forehead, with the view of acting upon the branches of the fifth pair of nerves. Afterwards I substituted a concentrated tincture of ginger, of the strength of one part of ginger to two parts of spirits of wine decolorised by animal charcoal.

The success of this application was remarkable: in many cases it had the effect of doubling the length of vision. In some persons I found the iris was not much dilated, but very torpid. In these cases I applied the concentrated tincture of pepper, made of the same strength and in the same manner as the tincture of ginger. This I used until I observed that the iris had obtained a greater power of contraction and dilatation: after which I had again re-

course to the tincture of ginger. This plan of treatment has been attended with the most signal success, and persons who were extremely short-sighted have very soon become enabled to lay permanently aside their concave glasses. The best method, I may observe, of testing the improvement of the sight during this treatment is, not by taking a printed book, and holding it near, and then at a greater distance from the eyes; this range of vision is much too limited; it is better to fix the attention of the patient upon some distant object, such as the brass key-hole of a door, and by his stepping some paces backwards, so as to place himself at a greater distance from it, he will soon discover the progress he is making.

So important a discovery as this will, I hope, be fairly tested by the members of our profession, who may rely on the success of the treatment I have recommended, if it be only judiciously and carefully carried out.

It is possible that the advantage derived from the tincture as above described may be ascribed to the alkaloid principle, *piperin*, which is held in solution in the tincture of pepper.—*Med. Gazette. Nov.* 15, 1851, *p.* 163.

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## 113.—ON THE USE OF GLYCERINE IN CERTAIN FORMS OF DEAFNESS.

By T. H. Wakley, Esq., Surgeon to the Royal Free Hospital.

[Nearly two years have elapsed since the publication of Mr. Wakley's paper on this subject, but any speculation which there might have been at that time upon the subject is now at an end, and now it takes its place on indisputable facts as one of our most useful remedial agents, in the treatment of several common forms of deafness. Mr. Wakley remarks:]

If the surface of the auditory canal be hard and inelastic, shining, and of a whitish appearance; if the natural secretion be wanting, and the membrana tympani be not painful to the touch, the glycerine may be employed with a tolerable certainty of success, even if a partial deafness has been of many years' duration. An uneven appearance of the external membrane of the drum is an unfavourable sign, as in some instances it may be caused by displacement of the bones of the delicate aural structure. When, besides the sense of hearing, the other senses are deficient of action, the employment of glycerine alone offers no hope of success. In such cases the utmost possible attention should be paid to the general health of the patient, with a view to restore the activity of the nervous system. The existence of paralysis in any part, unless from a traumatic cause, is an adverse indication with respect to the use of glycerine. The modes of applying the remedy vary according to the state of the parts, and the effects sought to be produced. When the surface of the aural canal is dry and shining, the ears are to be carefully cleansed by means of cotton held within the blades of a pair of forceps, and moistened with warm water. The canal is then to be rubbed with dry cotton, held in a like manner. Next the glycerine is to be applied by the same means, the cotton well soaked in it, having been repeatedly passed backwards and forwards in the external meatus, care being taken to diffuse it over the surface of the tympanum.

I shall now mention some cases, selected from my note-book, as furnishing good types of the disease which have been relieved by this mode of applying glycerine. They might be multiplied to a very large number.

Mary R ——, Gray's-inn-lane; November 19, 1850; aged forty-nine; a strong, healthy-looking-woman, an out-patient of this hospital. Deaf six years; could not hear the highest power of sonometer; ears dry and horny; membrana tympani of the right side ulcerated after a discharge, (following scarlet fever,) lasting six months; in the other ear the membrane was sound. The ears were rubbed with glycerine in the usual way, and in a few days she heard successively Nos. 8 and 7 of the sonometer. In seven weeks she was quite cured, a healthy secretion of wax having been established.

Anne M ——, Gray's-inn-lane; aged thirty-three; a spare thin woman; had been deaf since the birth of her last child, when she had discharge from both ears; this ceased, and left her very deaf. Her ears presented much the same appearance as in the last case, the principal feature being the dry condi-

tion of the meatus. Glycerine was applied with the forceps and wool, and the woman was soon relieved from the unfortunate impediment.

Louisa R——, Hampstead, August, 1850, aged twenty-seven, deaf nine years. Ten years since, had measles, followed by a discharge, which lasted four months; it then ceased in both ears, and she has been deaf ever since that period. Hears better after washing her ears. The only peculiarity to be observed was a total want of wax. The glycerine was applied in the usual way, and gave almost instant relief. In six weeks her hearing was quite restored. This was a very remarkable case.

In other cases where the ears are plugged with hardened, impacted wax, and where the membrana tympani is only coated with vitiated wax, the glycerine must be dropped into the ear three or four times during the day. In twenty-four hours the hardened mass will generally become sufficiently softened for removal—a little operation which requires some caution in its performance. If force be used, a portion of the delicate membrane of the drum may be torn away, and unpleasant consequences ensue. The mass will generally separate without force of any kind, if the means recommended be carefully followed; gentle syringing will also promote the separation. A pellet of fine sheep's wool, moistened with glycerine, should be placed in the meatus, in order that the newly exposed surface may be brought under the direct operation of the remedial agent. The pellet also would be of use in protecting the parts from the effects of cold and the sudden influence of the air. The removal of an empacted mass of exsiccated cerumen without these precautions may produce more deafness than the presence of the offending substance.

Master F——, City-road, aged six years, deaf in the right ear six months. Has had a constant roaring noise in that ear; which was frequently swollen, and very sore; he had been ordered purges and lotions, from which no benefit resulted. On examination, the meatus was found completely blocked up with hardened wax. I filled the ear with glycerine, and then fitted the plug. The next morning I easily removed the obstruction, and in it was found a good sized cherry-stone. The hearing was painfully acute for a few days. Sheep's wool was kept in the ear. I mention this case to show how necessary it is thoroughly to investigate every case which presents itself to you. I remember another instance occuring in a member of parliament, who was annoyed at intervals for two years by a discharge from, and painful swelling of the right ear. At last the dens sapientiæ of that side became painful, and the gum inflamed; this tooth was removed, and the ear was soon well. This case I consider very instructive; and the close proximity and anatomical relations of the part justify the supposition, that the diseased condition of the tooth caused the deafness and discharge from the ear.

H. A——, aged forty-three; Sept. 1850; an out patient of this hospital; very deaf in the right ear; could not hear No. 3 of the sonometer; cannot refer it to any cause; it appeared very gradually. He suffers from a "blowing sound" in that ear; when masticating his food, each fall of his jaw sounds like the report of a pistol; at other times he hears loud crackling noises. As I suspected in this case, an impacted mass of solidified wax was found, filling up the inner third of the meatus. Glycerine was poured in until the meatus was full; the bees-wax plug was then applied. In two days the wax was completely softened, and could be easily removed. The hearing was completely restored.

Another mode of applying the glycerine consists in soaking a pellet of sheep's wool in the fluid, and pushing it gently into the meatus until it rests against the drum. The wool, when compressed, should be about the size and shape of the aural cul-de-sac. A plug of prepared bees-wax, warmed in hot water, and placed against the external opening, and retained there, will effectually prevent both the entrance of the atmospheric air and the exit of the glycerine. This proceeding must be repeated every morning, the meatus being each time carefully cleansed by means of warm water, and made dry by passing backwards and forwards a small piece of dry cotton; then there will be a clear surface for the action of the glycerine.

One of the judges of the superior courts consulted me, with the concurrence

of Sir B. Brodie. The learned judge was suffering from deafness in the right ear. The organ had become quite useless. The left ear was also partially deaf, but with the assistance of a very clever instrument, made by Mr. Rein, Strand, he was enabled to continue his judicial duties. On examination with the speculum auris, assisted by a powerful reflector, I found the lining membrane of the meatus dry and polished, the canal open and very straight, and the membrane of the drum of a pearly whiteness, the central part projecting into the meatus, and presenting even more opacity than the other parts; no ceruminous secretion whatever. The air could be heard to strike against the tympanum in both ears; this membrane was intact on both sides. I applied the wool well saturated with glycerine, to the membrane, fitting the bees-wax plug, which effectually prevents the entrance of atmospheric air or the exit of the glycerine, thus keeping the agent constantly against the part to be acted on. This proceeding being repeated every morning, the meatus being gently cleansed with warm water before fresh glycerine was introduced. At different intervals, four distinct layers of white, pulpy epithelium were removed; the ear was occasionally swollen and painful. The treatment was persevered in for more than two months, and the membrane of the drum was much altered in appearance, assuming more of the dark look of the healthy organ. I introduce this case, not as a successful one in its results, but as illustrating very beautifully the mechanical action of the agent in the worst case of epithelial thickening which I have ever seen. In this case, had the deafness been due to the mechanical obstruction, it would have proved beneficial, but the cause was purely nervous, as had been previously diagnosed by Sir B. Brodie. There can be little doubt, that in many cases this cuticular deposition is the cause of deficient hearing, but it may be that the paralysis is the exciting cause to this morbid action.

M. O——, Clerkenwell, aged fifty-three, August, 1850. Deafness in both ears; followed a severe attack of influenza; never had any discharge from either ear; occasional pain in both ears; when travelling in a railway carriage hears better than other persons. On examination the aural cul-de-sac was found to be dry and inelastic, and to have the appearance of parchment; the membrana tympani looked white, and of a cartilaginous consistence; no wax or moisture of any kind; the meatus and tympanum painful to the touch. The glycerine was used as in the last case. From the right ear two pieces of epithelium, of a pulpy consistence, were removed, and one thick piece from the left ear. In seven weeks she discontinued her attendance, hearing, when at church, the clergyman of the parish, a blessing which (as she had stated) she never again expected to enjoy. I had twice to modify the treatment in this case, as some pain and swelling supervened.

Henry M——, Esq., a merchant, aged sixty-two, consulted me October 16, 1850. Had been deaf for more than twelve years in his right ear; he could not hear the loudest tone of the sonometer. The meatus had quite a "parchment appearance." The ear was filled with glycerine, and the bees-wax plug introduced. This was repeated every day. In fourteen days several pieces of soft skin-like substance were removed with evident improvement to the patient, who could now hear No. 3 of the sonometer. I was obliged to modify the treatment once, as the patient complained of pain. In this treatment, the general health, especially the secretions, should always be watched.

Mary M——; Sept. 15, 1850; Brentford; aged twenty-six; deaf in both ears; could not hear the highest tone of the sonometer; meatus dry and inelastic; tympanum much thickened; not perforated; not painful to the touch. Treated as in the preceding case; treatment lasted six weeks. Two portions of cuticular soft substance came away from the right ear; the left did not appear much affected by the glycerine. In six weeks the patient heard No. 3 of the sonometer, at a distance of two feet from the ear. No improvement whatever in the right ear. I saw this patient a few days since; she states that the relieved ear fully answers all the purposes required.

When patients are treated in this way, they, of course, require the careful attention of the surgeon. The *modus operandi* is simple enough; the glycerine being kept continually in contact with the part, acts mechanically, either

absorbing or penetrating the epithelial coating and separating the individual particles. The ordinary time required for this treatment varies from two to eight weeks, according to the method employed. With respect to the permanence of the relief—some cases always require the presence of glycerine, as the best known substitute for the natural secretion of the aural membrane. The frequent introduction of glycerine tends to restore the external meatus to a healthy condition, and fit it for the proper transmission of sound.

I mention the following case as one amongst several which I have seen, proving that glycerine, if it be not quite pure, and made according to the proper formula, may cause irritation, and produce other unpleasant symptoms; and there is little doubt that from such cause this really valuable remedial agent has frequently suffered in repute.

A lady living at the West-end, aged sixty-eight, consulted me two years since for deafness in both ears. They presented the appearance which indicated the use of glycerine. During eighteen months she lubricated her ears with this agent, receiving considerable assistance and comfort from it, and entirely laying aside the acoustic instrument which had been previously ordered. One morning I was hastily summoned to this lady; she was in considerable pain; the right ear greatly swollen and inflamed; she was much alarmed. She stated that she had used the glycerine regularly. The cause of the pain and swelling I soon discovered to be the stale and impure glycerine, which appeared quite changed in character, having an offensive smell, and being too light in colour, of thin consistence, and deficient specific gravity. This *contretemps* was treated in the usual way, and she again uses pure glycerine with the same advantage as before.

In the removal of foreign bodies from the ear the glycerine is often eminently useful. Some months since a solicitor of Gray's-inn consulted me respecting pain and deafness in the right ear; he had suffered much pain for five months. The annoyance had so affected his general health that he was quite incapacitated from following his professional pursuits. There was an occasional discharge from the ear. The meatus and external parts were swollen, sore, and emitted a light muco-purulent fluid. There was a mass of offensive-looking wax. On being touched with a probe it was hard and resisting. The glycerine was dropped into the ear in the manner just described. On the next day the impacted mass was easily removed. When examined, in the midst of it there was found a common *fly*, a foreign body which had evidently been the cause of the mischief. The use of the glycerine was continued for a few days, the pain ceased, and the hearing was soon restored.—*Lancet*, *January* 18, 1851, *p.* 64.

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# MIDWIFERY,

## AND THE DISEASES OF WOMEN.

### 114.—ON THE DISTRIBUTION OF THE NERVES OF THE UTERUS.

By Dr. T. Snow Beck.

Before describing the distribution of the nerves of the uterus, vagina, and neighbouring organs, it is necessary briefly to recal the constitution of the sympathetic nervous system, as attention to this is essential to the full understanding of the subject.

The sympathetic nervous system is described as consisting of three parts:

1. The two gangliated cords which extend down each side of the vertebral column. 2. A series of plexuses in front of the vertebral column, as the cardiac plexus, the solar plexus, the aortic plexus, the hypogastric plexus, &c., from which branches are sent to the different viscera. 3. Small ganglia, dispersed through the cranium, as the ophthalmic ganglia, the otic ganglia, the spheno-maxillary ganglia, the submaxillary ganglia, &c.

This system of nerves is also said to be connected with the spinal nerves by two roots—a white root and a grey root—and to be composed of an admixture of tubular nervous fibres and gelatinous nervous fibres. This description, however, gives a very imperfect idea of the constitution of the sympathetic nervous system.

Passing over the various opinions which have been expressed respecting this part of the anatomy, as being foreign to the present object, and as requiring too much space, I will sketch the structure of the sympathetic nervous system, as I believe it to be.

The nerves distributed over the body, to which the name sympathetic is applied, are composed of two kinds of nervous fibres very distinct from each other: the tubular nervous fibre, and the gelatinus nervous fibre. The tubular nervous fibre is derived from the brain and spinal cord, and, in whatever part of the body it is found, can always be traced to one of these organs. The gelatinous nervous fibre has its origin in the various ganglia of the sympathetic, whether these ganglia be situated at the sides of the vertebræ, on the posterior roots of the spinal nerves, in front of the vertebræ, dispersed through the cranium, or elsewhere situated in the body. The branches of nerves which have been called roots of the sympathetic system, are,

(*a*) The white branch, which is a branch from the spinal nerve. It is composed of two parts, one half from the posterior, and the other half from the anterior root of the spinal nerve; then passes inwards to the sympathetic ganglia, and becomes associated with the gelatinous nervous fibre proceeding from it, and these are together distributed to the different viscera.

(*b*) The grey branch, which arises from the ganglion, soon subdivides, and is finally distributed to the parts in the neighbourhood. It is a branch of the usually-called sympathetic system.

Hence there are two distinct systems of nerves: the one formed by the gelatinous nervous fibre, which, together with the ganglia from which they arise, constitutes the true sympathetic system; the other, composed of the tubular nervous fibre, which, with the brain and spinal cord, forms the cerebro-spinal system. The gelatinous nervous fibre being chiefly distributed to the viscera, is found in greatest quantity near these organs; the tubular nervous fibre, being concerned in sensation and motion, exists in greatest amount in the skin, muscles, &c. These two systems, associated together in varying proportions in the middle part of their course, constitute the sympathetic system as it is generally described. Yet these two systems (although associated in the middle part of their course) are totally distinct from each other at their origin and at their termination. At their origin, where the tubular fibre arises separately from the brain and spinal cord, whilst the gelatinous fibre arises only from the sympathetic ganglia. At their termination, where the tubular fibre separates from the gelatinous fibre, and each is separately distributed to the elements of the organ they are destined to supply. Minute microscopic nerves being found, which consist solely of the gelatinous nervous fibre.

The plexuses, then, in front of the vertebral column, and which furnish nerves to the various viscera, are composed of this association of the two systems of nerves, and to this class belong the aortic plexuses with their prolongation into the pelvis—the hypogastric plexus, the composition and distribution of which it is our special object to examine.

The superior aortic plexus, lying between the superior and inferior mesenteric arteries, is composed of an assemblage of ganglia, giving origin to the gelatinous fibre and branches of spinal nerves derived from the lumbar and lower dorsal nerves, with some communicating branches from the solar plexus. From this association of the two nervous fibres, or nervous systems, branches are sent along the inferior mesenteric and hæmorrhoidal arteries to the de-

scending colon and rectum, and branches are prolonged downwards, to form the inferior aortic plexus, which, at the margin of the pelvis, separates into two divisions, each of which receives the name of the hypogastric nerve or plexus. These plexuses pass round each side of the pelvis to reach the sides of the uterus, and there dividing and subdividing into minute branches, are finally distributed to the lower part of the organ. The middle part of the uterus is further supplied by a distinct branch which passes off from the upper part of the hypogastric plexus, and entering the broad ligament, so reaches the organ; whilst the upper part of the uterus is supplied by branches which come from the renal plexus, and, in company with the spermatic artery, descends to the ovary, furnishes branches to it, and finally is distributed to the upper part of the uterus.

Thus the uterus is supplied, in the inferior and middle part, by branches of gelatinous fibre, the true sympathetic nervous system, derived from the ganglia of the superior aortic plexus and lumbar ganglia, with some communicating branches from the solar plexus; and branches of spinal nerves, cerebro-spinal nervous system, derived from the lumbar and lower dorsal nerves. Nerves derived from the same sources are also distributed to the descending colon and rectum. The upper part of the uterus being supplied by gelatinous nervous fibres, derived from the solar plexus, and by spinal nerves derived from the splanchnic nerves, which are branches of the upper dorsal nerves. From the solar plexus, *i. e.*, from gelatinous fibres from the semilunar ganglia and dorsal ganglia, and branches of the dorsal spinal nerves, branches are also distributed to the stomach, small intestines, liver, kidneys, &c.

As the hypogastric nerve on each side passes to the side of the uterus, it sends down branches from the lower border, which, joining with branches from the sacral nerves, forms a complicated plexus on the side of the vagina—the pelvic plexus. Small ganglia of the sympathetic are found in this plexus, but it is chiefly composed of the cerebro-spinal nerves; and in this it differs essentially from the hypogastric plexus. From the pelvic plexus comparatively large nerves are distributed to the vagina; and considerable sized nerves are sent to the bladder; whilst small branches are furnished to the lower part of the rectum.

The nervous supply of the vagina, bladder, and lower part of the rectum, differs in these points from the nerves distributed to the uterus. (*a*) In the source from which they are derived: those to the uterus, arise from the lumbar nerves and gelatinous or sympathetic nerves coming from the superior aortic plexus and from the solar plexus; those to the vagina, bladder, and lower part of the rectum, take their origin from the sacral nerves, and the sympathetic fibres from the ganglia of the pelvic plexus, with some branches from the hypogastric plexus. (*b*) In the composition: those to the uterus being composed of a large amount of sympathetic fibres, and a small amount of cerebro-spinal fibres: those to the vagina, bladder, &c., by a large amount of cerebro-spinal fibre, and a smaller amount of sympathetic fibre.

The muscles and skin of the perinæum and lower end of the rectum are supplied entirely by branches from the sacral nerves—the pudic nerve. Thus, as we proceed upwards, from the skin and muscles of the perinæum to the vagina, and thence to the uterus, we meet with less and less of the cerebro-spinal system or tubular nervous fibre; and more and more of the sympathetic system, or the gelatinous nervous fibre. And, as a consequence, the effects of disease or injury to the tissues are less and less felt, as we pass from the skin to the uterus; and the actions of the organs are more and more, though not entirely, withdrawn from the influence of the will.

Briefly, then, to recapitulate the anatomy of the nerves of the uterus, we find the following arrangement:—

1. The lower and middle portions of the uterus are supplied by the sympathetic from the superior aortic plexus and the lumber ganglia, and by cerebro-spinal nerves from the branches of the lumbar and lower dorsal nerves.

2. The ovaries and upper part of the uterus are supplied by the sympathetic from the solar plexus and thoracic ganglia; and by spinal nerves, from the intercostal nerves, by means of the splanchnic nerves.

3. The vagina and bladder are supplied by branches from the sympathetic from the ganglia in the pelvic plexus, also from the superior aortic and lumbar ganglia, through the medium of the hypogastric plexus; and by spinal nerves from the branches of the sacral plexus.

4. The muscles, skin, &c., of the perinæum, are supplied by branches from the sacral plexus.—*Med. Times, November* 23, 1850, *p.* 538.

## 115.—ON THE STATE OF THE NERVES DURING PREGNANCY.

By Dr. Snow Beck.

[Dr. Beck states the following facts in support of the opinion that the nerves are not increased in size during pregnancy. He says:]

These facts are obtained from a series of dissections, which show that no enlargement of the nerves has taken place, and that a special provision exists for their distribution over the gravid uterus without any augmentation of their size.

The dissections consist of—1. The dissection of a gravid uterus in the full period of pregnancy, taken from the body of a well-proportioned healthy woman who had died from hæmorrhage within two hours after the birth of the child. 2. The dissection of the uterus of a woman who had previously borne children; care being taken to select one as near to the stature and as well-proportioned as the former, to avoid, as far as possible, any difference which might depend on individual peculiarity. 3. The dissection of a virgin uterus, taken from the body of a young lady, who died from phthisis pulmonalis, aged twenty-five years. 4. The verification upon recent specimens of the results of the previous dissections. 5. The dissections of the virgin uterus by Dr. Robert Lee.

These dissections being all made after the same method, *i. e.*, by the removal of the fibro-cellular neurilemma, when compared together incontestably show that the nerves are of the same size in all; or, in other words, that the nerves have undergone no alterations in size, either from age or from pregnancy. Upon this point, I am glad to have the dissections of Dr. Lee to appeal to, as proving that the nerves of the virgin uterus are as large as the nerves of the gravid uterus at the full period of pregnancy, especially when it is remembered, that these dissections were made to prove that the nerves of the virgin uterus were smaller than those of the gravid uterus. The means by which this demonstration was attempted have been already pointed out.

An objection has been made to this series of dissections, viz., that they are not sufficiently numerous to prove that no alteration takes place in the nerves from pregnancy. To those who are unaccustomed to the labour of minute dissection, this objection may appear to have some weight; but, when I know that it took me nearly twelve months, working some hours every day, to make one dissection with that care requisite to make it of any value, I am perfectly willing to leave the making of further dissections, in order to remove unnecessary objections, to those who are not satisfied with the present demonstration, begging them, at the same time, to remember, that *one* dissection, carefully made, can be depended on for the results obtained; but *twenty* dissections, hastily made, and without due care, are worse than valueless for the elucidation of the point at issue. They are valueless because they do not prove any thing satisfactorily; they are worse than valueless, because they lead to much loss of time, by provoking useless discussion.

An *à priori* objection has been raised to these proofs, on the grounds, that the nerves of the virgin uterus, being as large as the nerves of the gravid uterus, shows that some change must have taken place, otherwise "they would, if unchanged in structure, appear attenuated to an extreme degree," when stretched over the increased superficies of the gravid organ. Dr. Tyler Smith writes, ('On Parturition and Obstetrics,' p. 71,) "Those who maintain that the nerves do not increase in size during gestation, must show, not only that there is no such increase in the gravid, as compared with the virgin uterus, but they are bound to show that the nerves relatively diminish in breadth during pregnancy; for, when we consider the extent and superficies of the

fully developed gravid organ, it must be evident to the meanest capacity, that as the nerves of the virgin uterus, remaining stationary as regards size, are merely stretched upon, drawn out, or unfolded over and in the enormously increased gravid organ, they ought proportionally to appear as much *diminished* as the growing tissues of the uterus are *increased* in size." Dr. T. Smith, however, appears to forget, that in order to make this a valid argument, it is necessary to show that the nerves of the virgin uterus are only of such a length as to allow of their distribution to the virgin organ. Had he *really* inspected the preparations of Dr. Lee as much as in his writings he would wish to make it appear, he would have perceived that in the virgin uterus the nerves, when even only partially dissected, on the body of the organ, can be drawn out to a surprising length,—very much longer than is requisite to supply the virgin uterus.

Rightly considered, anatomy affords one of the best *à priori* arguments against the enlargement of the nerves during pregnancy. First, it discloses a marked folded arrangement of the nerves, both in the immediate neighbourhood of the uterus, and on the body of the organ; and, secondly, it shows a peculiar distribution of the nerves to this organ, whereby these nerves can be distributed over the uterus, when considerably enlarged, with greater facility than at first sight would appear. This peculiar mode of distribution consists of the lower third of the uterus being supplied by branches from the lower part of the hypogastric plexus; the middle third of the organ, by a distinct branch from the upper part of the hypogastric plexus, which, entering the broad ligament, reaches the uterus without any communication with the nerves lower down than the pelvis; whilst the upper third derives its branches from the renal plexus, these come down with the spermatic artery, and, after supplying the ovary, are distributed to the upper part of the uterus. In consequence of this mode of distribution, the enlarged gravid organ, when it rises in the abdomen, is brought nearer to the origin of the nerves distributed to it, and consequently, they (the nerves) can be spread over the enlarged organ with greater facility than if the nerves had been solely derived from the lower part of the hypogastric plexus.

Now, when the marked folded arrangement, already noticed, is added to this unusual mode of supply, we perceive that nature has furnished ample means whereby the nerves can be distributed over the enormously increased gravid organ without their undergoing any augmentation in size; and has thereby furnished one of the best *à priori* arguments against the enlargement of the nerves during pregnancy. An examination of the preparations themselves, at present in my own possession, will make this much more evident than any mode of expressing it upon paper can possibly do.

The only *à priori* reason which, it appears to me, can be assigned that the nerves should enlarge during pregnancy, arises from the great increase in the whole of the tissues of the organ. But this withdraws the objection to the possibility of the nerves being distributed to the greatly enlarged uterus, and places it upon a very different question, viz., the necessity for the enlargement of the nerves with the increased growth of the organ; or, in the language of a reviewer, "it certainly does seem to us anything but unreasonable to suppose that, with the enormous development of the muscular and other structures, the vast increase of the supply of food, and the elevation in the entire functional activity of this wonderful organ, there should be a necessity for an augmentation of its nervous supply." Yet, to admit this, except upon positive evidence, would be as unphilosophic as to deny it, except upon evidence equally strong. Any arguments drawn from the supposed functions of the sympathetic cannot be considered of much weight, seeing, that with all our labours in that direction, we know, as yet, very little about it. Even should we admit the supposition, that the functions of the sympathetic "would be to regulate, through their action on the arterial coats, the afflux of blood to the organ, in accordance with its functional activity," this does not, of necessity, require the nerves to be enlarged, in order to exercise this influence on the arterial coats.—*Med. Times, January* 4, 1851, *p.* 9.

## 116.—ON THE MOVEMENTS OF THE UTERUS.

By Dr. Snow Beck.

[In his remarks upon this subject when treating of the physiology of the uterus, Dr. Beck observes:]

On considering the contraction of the uterus, I have always thought that the apt simile of the late Professor Reid, applied to another part of the nervous system, well illustrated the subject: "The movements of a horse are independent of the rider upon his back; in other words, the rider does not furnish the conditions necessary to the movements of the horse: but every one knows how much these movements may be influenced by the hand and heel of the rider." To apply this to the present subject, the contractions of the uterus are independent of the cerebro-spinal system, though every one knows how much these contractions, may be influenced by the actions of this system. According to these views we have to consider—

1. The movements of the uterus; peristaltic in form, and effected through the agency of the true sympathetic system.

2. The influences which affect this movement—

a. Through the brain, as in volition and emotion.

b. Through the spinal cord, as in reflex action.

1. *The movements of the Uterus Peristaltic in Form, and Effected through the True Sympathetic.*—Although I do not mean to say that direct irritation, acting upon a portion of inorganic muscle, will not cause the point irritated to contract, independent of the influence of the nervous system, yet the vermicular or wave-like contractions of the uterus, which spread from one part irritated over the whole organ, appear to require the influence of the sympathetic system for their proper accomplishment. "In organs partly or wholly supplied by ganglionic nerves, as the heart, bladder, intestines, œsophagus, &c., the motion produced is of a peristaltic kind, spreading generally in a vermicular manner to a distance from the part irritated, and continuing for some time after the irritation has ceased. The uterus is eminently endowed with this form of contraction."

That the contractions of the heart and intestines are independent of the action of the cerebro-spinal system is shown by a variety of evidence, part of which is the continuance of the contractions for some length of time after these organs have been removed from the body; but that the contractions of the uterus at the full period of pregnancy, or when induced by other means, are equally independent of the cerebro-spinal system, and may of themselves effect the expulsion of the child, is more difficult to be shown. Although I cannot go the length of the reviewer I have so often quoted, in saying, "The muscular action of the uterus we regard as essentially peristaltic and independent of nervous stimulation," yet I agree with the opinions in the following quotations from the same:—"That the uterus is susceptible of being excited to contraction by reflected stimulation no more proves that its ordinary actions are dependent on the spinal cord, than the influence of remote excitants upon the actions of the heart and alimentary canal proves that these actions are essentially reflex in their nature. In fact, it does not appear to us at all difficult to show, that the influence of the nervous system, on the uterus is precisely of the same character with the influence of any stimulus directly applied to that organ, and is very different from the ordinary forms of reflex action, as seen in the muscular system of animal life. Thus it appears, that when uterine contraction is excited through the nervous system, it is not by a new and powerful agency taking the place of the feebler powers of the organ itself, but by the application of a new stimulus, which causes remote irritation to have the same effect as one of a direct or immediate kind; so that the peristaltic contractions of the uterus are really its only mode of expelling its contents."—As, however, much difference of opinion still exists, whether the contractions of the uterus are dependent or not for their commencement and continuance upon the cerebro-spinal system, I will give hereafter the evidence in support of both opinions.

2. *The Influences which affect the Movements of the Uterus,*—(a) *Through the Brain—Volition.*—The influence of the will upon the contractions of the uterus

is sufficiently well known. Although the will has no distinct power over the uterus to cause it to contract or to stop these contractions when once established, and although the contractions will continue when the power of the will is temporarily suspended, as during coma or complete intoxication, or when under the influence of complete anæsthetic agents, yet every practical accoucheur must have seen cases where the influence of the will was obvious in increasing the contractions of the uterus when deficient in force, or in retarding these contractions when violent, or when they are exceedingly painful. Increasing the contractions, as when, from dread of instrumental interference, the patient exerts her will, and, adding to the efficacy of the previous languid contractions, effects the expulsion of the child without the aid of the accoucheur. Retarding the contractions, when, from the dread of the suffering they produce, the patient exerts her volition to keep them away as much as possible—in the language of the lying-in-room, "keeping back her pains." Cases similar to the following are also not unfrequent. A lady who has had two or three children, is suddenly taken in labour, and the accoucheur being from home, has to be sent for; when she voluntary restrains the force of the contractions, to retard for a time the birth of the child. As soon as the accoucheur arrives the contractions are allowed to take their course, and the labour is quickly over, the patient telling the accoucheur that she "kept back the pains until he came to her assistance." The influence of the will is also said to affect the contractions of the uterus, when the patient voluntarily closes the glottis, and, drawing inwards the walls of the abdomen, is said to "bear down." It is undoubted that the force of the contractions is increased by this means, but it must be remembered that two influences are in action; the influence of the will, which voluntarily closes the glottis with a definite object in view, being transmitted to the uterus, and the influence of the local pressure of the uterus by the surrounding viscera, and which appears to be the more powerful of the two. It is thus the combined actions of the will and of local irritation which produce the increased contractions of the uterus in this instance, and not the single influence of volition.

*Emotion.*—The influence of emotion upon the contractions of the uterus is too well known to require much illustration. The effect of the sudden introduction of a stranger into the lying-in room, or the sudden communication of bad news, in stopping for a time the contractions of the uterus, has been frequently noticed. Whilst the cheering influence of hope, confidence in attendants, and cheerful conversation, and the depressing influence of despair, want of confidence, sudden dislike to attendants, or melancholy conversation, are all well known to the practical accoucheur. To these may be added the emotion of the mother on hearing the child's cry, or at the sight of her infant, in producing the complete contractions of the uterus. There is, however, another class of emotions which have been generally, though I believe erroneously, attributed to the influence of the reflex action of the spinal cord. I allude to the influence which is produced on the contraction of the uterus, by suddenly plunging the hand into cold water, dashing cold water upon the face, taking a large draught of cold water, &c. In these cases the increased contractions of the uterus appear to depend on the influence produced on the system by the sudden application of the cold, and not, as is supposed, upon the reflex action of the cord, it being difficult to perceive through what media this latter influence can act.

(b) *Through the Spinal Cord—Reflex Action.*—The influence of reflex action of the spinal cord in increasing, and occasionally exciting the contractions of the uterus, has been abundantly recognised by most writers on the subject; and we shall see, when considering the pathology, that these reflex actions are the chief means by which the diseases of the uterus are made evident to the patient, and recognised by the practitioner. The contractions of the uterus are influenced through this means, by gently rubbing the abdominal surface at the commencement of a pain; by applying the hand previously cooled by immersion in cold water, to the same part; by dashing cold water on the abdomen, or upper part of the thighs; by the application of warm flannels to the abdomen; by the alternate application of cold and warmth to the abdo-

minal surface, when it has become accustomed to the continued action of either, so as no longer to be excited by their single application; by the injection of cold or stimulating fluids into the rectum; or by the introduction of the finger of the accoucheur to the upper part of the vagina. When the finger passes to the uterus, it then becomes a local irritant, and the increased contractions are induced principally by this means, acting through the medium of ganglia of the sympathetic; yet there can be no doubt that some reflex influence is combined with that of the local irritation.

*Combined Actions.*—It not unfrequently happens that two of these modes of influencing the contraction of the uterus are in operation at the same time, and produce more effect than either singly applied. For example *volition and local irritation* are combined in the instance already adduced, when the patient voluntarily closes the glottis, and contracts the abdominal muscles, by which means the uterus is subjected to local pressure from the surrounding viscera, and influenced by the same volition which closes the glottis and contracts the abdominal walls. It is a question, however, which I am not prepared to determine, whether reflex action is or is not added to this combined influence. That reflex action may be excited by the compression of the nerves of the abdominal muscles, in their contraction against the viscera, and so influence the uterus through the lumbar plexus, is possible; but I am not prepared to say how far the power of the will then in action may interfere with this reflex power.

*Emotion and Reflex Action* are combined when the child is applied to the nipple, and contraction of the uterus follows. Here, I have no doubt, the chief effect is produced by the emotion of seeing and feeling the child, together with the "singular feeling" which the child produces by sucking the nipple. At the same time, it is impossible to withhold the belief that some reflex action may also be induced through the inter-costal nerves acting along the splanchnic, and thence down the spermatic plexus to the upper third of the uterus. But as this reflex action can only excite one third of the organ, it is evident that the effect it will produce must be comparatively trifling. In the same manner I would explain the effect of a draught of cold water taken into the stomach, the chief effect being produced by the general emotion of the body, and a partial reflex action through the same media as in the last example.

*Emotion and Local Irritation.*—As in "taking a pain" during labour, after the patient has once felt the increased pain caused by the presence of the fingers on the upper part of the vagina. Here the emotion, caused by a remembrance of the increased pain induced, is added to the influence of the reflex action consequent upon the local irritation of the nerves at the upper part of the vagina.

The media through which the actions of the brain and spinal cord influence the contractions of the uterus are sufficiently evident on a reference to the distribution of the nerves of the uterus. There can be no doubt that it is chiefly through the branches of the lumbar plexus which pass inwards as the white communicating cords become mingled with the fibres of the true sympathetic, and reach the uterus through the hypogastric plexus; and partly by the branches of the inter-costal nerves, transmitted to the organ by the splanchnic nerves and spermatic plexus, as already explained. It has been stated, though on insufficient grounds, that the endowment of these nerves from the cerebro-spinal system becomes affected by their association with the fibres of the sympathetic; and consequently that the influence of the brain and spinal cord cannot be so readily transmitted by them. To give the quotation at length: "No anatomist, so far as we are aware, has traced any branches of the sacral nerves into the uterus itself: although it is unquestionable that branches of several nerves of the cerebro-spinal system pass into the plexuses of the sympathetic, and are in this way distributed to the organ. It may be said that the distinction is unimportant; but we cannot regard it as being so, for it is obvious that the endowments of the cerebro-spinal fibres, which enter other parts of the sympathetic system, are greatly affected by their association with it, neither sensory impressions nor motor impulses being as readily con-

veyed by these fibres as they are by the ordinary cerebro-spinal nerves."—Brit. and For. Medico Chirurg. Review, p. 6.

An important difference is here drawn in the endowments of the nerves, and consequently in the influences which they transmit, between the branches of spinal nerves which pass directly from the sacral plexus to the uterus itself, and those which reach the organ through the medium of the sympathetic. I am, however, unable to perceive any foundation for this opinion. It is said that motor impulses are not so readily conveyed by the cerebro-spinal fibres which enter into the sympathetic system as they are by the ordinary cerebro-spinal nerves. Certainly we have not the same motor power over the organs supplied by the sympathetic system as we have over the voluntary muscles. But it is nowhere shown, that I am aware of, that this depends on an alteration of the endowments of the cerebro-spinal fibres, and not on the anatomical condition of the organs themselves. We can easily understand that the voluntary striated muscle would be much more obedient to the motor impulses from the brain than the inorganic non-striated muscular fibre, although the media by which this impulse was transmitted remained the same in both cases.

It is also stated, that the transmission of sensory impressions is interfered with by the presence of ganglia upon the nerves which transmit these impressions, assigning to the ganglia the office of "cutting off sensation." As, in the transmission of motor influences, it is nowhere shown, so far as I am aware, that this diminished sensory impression does not depend upon the anatomical condition of the organs which furnish this impression, and not upon the presence of the ganglia in the course of the nerves. We can readily believe it possible that the ultimate distribution of the cerebro-spinal filaments upon an organ, chiefly supplied by the sympathetic nervous system, may be different from the distribution which is followed in an organ immediately under the influence of the brain, and chiefly supplied by the cerebro-spinal fibres; and that this anatomical condition may influence the transmission of sensory impressions. It is certainly contrary to the view which assigns to the ganglia the office of "cutting off sensation," to find one of these ganglia always seated on the posterior or sensitive roots of the spinal nerves. In this situation, it in no way interferes with "the sensory impression" transmitted from all parts of the body. Why, then, should it be considered to do so when seated in the abdomen?

In considering this question, we ought not to overlook, that the amount of cerebro-spinal filaments distributed to an organ supplied by what is ordinarily called the sympathetic system, is considerably smaller than that which is furnished to an organ supplied by the ordinary cerebro-spinal nerves. And as the degree of sensory impression transmitted from an organ, and the amount of motor influence which can be exerted over an organ, bears a close relation to the amount of cerebro-spinal filaments furnished to the part, so we have another reason for the fact under consideration, without attributing to the sympathetic ganglia the office of altering the endowments of the cerebro-spinal filaments with which they are commingled. During some of the diseases of the organs supplied by the sympathetic, or during the healthy actions of the uterus in parturition, the sensory impressions are transmitted with sufficient acuteness in the severe pains which are experienced. It cannot be considered that the ganglia exercise the office of "cutting off sensation" at these times; why, then, should it be considered that their office is altered during health?

But to pursue this subject further would lead to an examination of the comparative anatomy of the nervous system in the lower classes of animals, which forms no part of the present inquiry, but which I hope to take up on another opportunity.

To recapitulate what has been stated. The motor powers of the uterus consist solely of the peristaltic contractions of the organ, which are dependent for their full production upon the nerves and ganglia of the true sympathetic; yet these peristaltic contractions may be influenced by the brain, as in violition or emotion; by the spinal cord, as in reflex action; or by a varying combination of these influences. The media through which those influences act upon the uterus, being the branches of spinal nerves sent inwards

to the viscera. This, however, introduces the question which has been deferred, viz. Are the contractions of the uterus dependent or not upon the cerebro-spinal system for their continuance?—*Med. Times, January* 25, 1851, *p.* 89.

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## 117.—THE CAUSE OF THE CONTRACTIONS OF THE UTERUS.

By Dr. T. Snow Beck.

[There seem to be two distinct opinions held upon this subject. 1st. That the contraction of the uterus depends upon the influence of the cerebro-spinal system. 2nd. That they are independent of the cerebro-spinal system, although they may be influenced by it.

On reviewing the evidences in favour of the first opinion, viz., their dependence upon the cerebro-spinal system, we have—]

(A) The experiments, which show—

(a) That the division of the spinal cord in the dorsal or cervical region will only cut off the influence of the brain, *i. e.*, volition and emotion from the actions of the uterus.

(b) That the lower portions of the spinal cord remaining entire, the reflex actions of the cord will not be withdrawn from the uterus.

(c) That with this condition the uterine contractions were arrested: hence,

(d) That the "shock" of the operation was sufficient to arrest the uterine contractions during the few hours which the animal lived.

(e) That by irritating the uterus and spinal cord by galvanism, or irritating the lumbar portion of the cord by the introduction of a stilette, the uterine contractions were partially recalled.

(f) That in the guinea-pig, integrity of the lumbar portion of the spinal cord, and destruction of the sacral portion, did not prevent the contractions of the uterus, nor the process of parturition being accomplished.

(B) The cases of disease, which show—

(a) That disease of the cervical or upper dorsal regions of the spinal cord, sufficient to produce paralysis, prevents the pains of labour being felt.

(b) That, notwithstanding this, the contractions of the uterus proceeded regularly in their course, and apparently unaltered in force.

(c) That in these cases the influence of the brain alone would be cut off; the lower portion of the spinal cord remaining entire, the reflex action will not be destroyed.

(d) That disease, seated probably in the lower part of the cord, or cauda equina, sufficient to produce paralysis of the lower extremities, does not prevent the pains of labour being felt, nor interfere with the uterine contractions.

(C) The experiments and cases of disease together show—

(a) That in every case the reflex action of the spinal cord was present: hence

(b) That they supply not the least evidence "that the contractions of the uterus are dependent on the cerebo-spinal system:" hence

(c) That the solution of this problem must be sought by other means.—*Med. Times, Feb.* 15, 1851, *p.* 178.

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## 118.—CASE OF DIFFICULT LABOUR IN CONSEQUENCE OF TWINS JOINED BY THE BREAST.

By Dr. Charles Stuart, Chirnside, Berwickshire.

[This was a case in which Dr. Stuart found the head presenting in the first cranial position and every other feature of the labour apparently very favourable, though he found that the strength of the pains was remarkably decreased on the patient laying down, although the pains on her moving about in the erect position were very violent.]

The cranium advanced with extreme slowness, considering the strong nature of the pains; and it was only after the most severe straining that the head began to press on the perinæum, and after a very tedious passage was born about

seven o'clock P.M. The pains previous to this were of the most frightful description, and they were now, if it were possible, increased. Some apparently insurmountable obstacle seeming at this stage to oppose the further exit of the infant, I tried by every means in my power to discover the cause of delay, but from the extreme tightness of the parts it was impossible to ascertain its nature. I dreaded, from the enormous straining, that the uterus would speedily rupture, unless delivery was immediately effected, so accordingly I applied at first gentle traction; but, when I found that unavailing, I was forced to increase it to what previously I would have considered a most unwarrantable degree, and succeeded in delivering the shoulders, when for the first time I discovered something unusual. I continued, however, my traction as my only hope of getting the woman delivered; and after using the greatest force, I was in no small degree astonished when another head came down with the face considerably flattened. This second head lay twisted round upon the back of the first delivered infant. After further perseverance, I succeeded in extracting two males, still-born, and intimately joined from the sternum to the umbilicus, into which an umbilical cord, common to both, was inserted. The placenta speedily followed, and was not larger than is usually seen in cases of twins. The umbilical cord was rather thicker than usual. About an hour elapsed from the time the head was born till the delivery was completed. The pains during that period were of the most agonizing and alarming character, and made me regret exceedingly having no chloroform. After a careful examination of the external parts, I was very glad to find no perineal laceration, which I feared very much from the passage of such a mass. The twins were at the full time, and fifteen inches long. The band of connexion extended from the upper part of the sternum to the umbilicus, and was seven inches broad and three long; and the diameter of the twins, when laid together, was six and a-half inches. They were perfectly and fully formed in other respects, but the head that presented first was the larger of the two. I failed in obtaining permission to make any more particular examination.

When we consider the breadth of the connecting band between the two children in the above case, we see more clearly how the head of the second child could assume the position that it did, and to what an extent the connecting band must have been stretched to have allowed of its being placed at the back of the shoulders of the other child when delivered.

My patient is a woman of slender figure, but well formed, and of good constitution. During her pregnancy she enjoyed excellent health, which in some measure strengthened her for the extreme trial she had to undergo, and which she endured with the greatest fortitude.

She has made a most excellent recovery, and is now quite strong.

No doubt the long delay before the head was born, in a great degree saved her from the danger of perineal laceration, as there was ample time for complete dilatation, which was so essential for the safe passage of such a mass as had to follow.—*Monthly Journal of Med. Science. January* 1851, *p.* 5.

## 119.—ACCOUNT OF A CASE IN WHICH THE CÆSAREAN SECTION WAS PERFORMED.

WITH REMARKS ON THE PECULIAR SOURCES OF DANGER ATTENDANT ON THE OPERATION.

By Dr. CHARLES WEST, Physician-Accoucheur to St. Bartholomew's Hospital, and Lecturer on Midwifery in the Medical College.

[In this case the patient was twenty-seven years of age, whose health had always been indifferent, though she was not apparently deformed; the only symptoms calling attention to the osseous system were pains of a rheumatic character, and difficulty in walking. When labour came on at the full period of utero-gestation, the pelvic deformity was ascertained and the propriety of the Cæsarean operation decided upon by Mr. Wren, Dr. West, Dr. Murphy and Dr. Ramsbotham. It was accordingly performed by Mr. Skey fourteen hours after the commencement of labour, and eight after the rupture of the membranes.]

The patient was, by her own desire, subjected to the influence of chloroform

before the operation was begun; no difficulty was experienced in its performance; and a living female child was extracted. Very formidable hæmorrhage succeeded the removal of the placenta; and the subsequent contractions of the uterus were very tardy in their occurrence. The patient was left in a state of great exhaustion, from which she never completely rallied, and died in 108½ hours after the operation, apparently from the conjoint effect of hæmorrhage during the operation, and of the shock to the nervous system. The treatment had consisted in the administration of stimulants and nourishment both by the mouth and in enemata; and the patient was kept in the same manner almost throughout under the influence of opium.

The body, on examination after death, presented no evidence of serious inflammation; but the uterine wound was gaping widely, and even that of the abdominal walls was but partially closed. The pelvis presented, in a most marked degree, all the characteristics of that deformity which is produced by mollities ossium; the pubic bones being projected into a beak 1·2 inches in length; the width of the pubic arch being reduced to 0·6 of an inch, and the distance between the tuberosities of the ischia 1·2 of an inch.

The writer, having noticed the high maternal mortality resulting from the Cæsarean section, and which he estimates at much more than the number of 63 per cent., at which the statistics of all cases recorded since 1750 places it,—since the results of cases occurring in hospitals abroad yield a maternal mortality of 79 per cent., and of cases in this country of 85·4 or 87·5 per cent., according to two different estimates,—proceeds next to point out the causes, apparently inevitable, of this high mortality.

These causes he refers to four heads; and illustrates their respective influence by reference to a Table of 134 fatal cases, in which the body was examined after death. The four heads are as follows:—

1st. The danger arising from hæmorrhage, which proceeds from a source different from that whence bleeding takes place in any other operation, and which is not capable of being arrested by the same means as suppress it under ordinary circumstances.

2d. That dependent on the shock inflicted on the nervous system, as well by the violent interference of the most important process that ever goes on in the organism within the same limited time, as by the injury to a part so important, and so richly supplied with nerves, as the uterus of a parturient woman.

3d. The hazard inseparable from extensive injury to the peritoneum, when unblunted in its sympathies, and unaltered in its texture, as in cases of ovarian or other tumours, for the removal of which a similar exposure of the abdominal cavity is sometimes practised.

4th. That which results from the infliction of a wound on the uterus at a time when, in the ordinary course of things, the processes which nature is prepared to carry on in it consist in the disintegration and removal of its tissue; processes the very opposite to those essential to the repair of injury.

From a consideration of all these sources of danger, to the last of which attention has hitherto scarcely been directed, the author arrives at the conclusion that they being so serious, and so beyond the power of art to prevent, the rule which forbids the performance of the Cæsarean operation wherever there is a reasonable probability of accomplishing delivery by the natural passages, is founded on solid grounds, and ought to be adhered to.

[At the meeting of the Royal Medical and Chirurgical Society after the read- of Dr. West's paper. Dr. Lee, after enumerating many cases, all of which showed the dreadful fatality of this operation.]

Proved how useless this operation had been, and the great advantage to be derived from the induction of premature labour in such cases, as proved by the experience of the best midwifery practitioners. Dr. Lee himself induced it twelve times in one woman, with perfect safety; and had read that morning an account of fifty other cases similar in result. Dr. Merriman remarks, respecting the induction of premature labour, that nothing is more easily done, and that it renders the Cæsarean section unnecessary and unwarrantable. Dr. Lee, in continuation, observed that Dr. Denman mentions a whole family in the Strand born by this process, and remarked, that it is not a thing well known, viz., its induction in cases of high distinction.

He said, in cases where the pelvis was so much distorted that the child could not pass at the seventh month, labour should be induced at the fourth or fifth; for that it was consistent with reason and humanity to preserve the life of the mother and produce abortion. He (Dr. Lee) did not consider pelvic deformity the only case applicable to this line of practice, but also cases where tumours or cicatrices obstructed delivery as well as in cases of organic disease of the heart. Dr. Lee said his object was to show the society that the operation of inducing premature labour was both safe and easily performed. From the paper now read it appeared Mr. Wren had seen Mrs. Williams for five months labouring under mollities ossium of the bones of the pelvis. Many cases occurred in which there was no bending of the spine, but with pain about the pelvis, gradual inability to walk, being obliged to be carried from place to place; that it appeared to him that it had never crossed Mr. Wren's mind that a destructive disease was going on in the bones of the pelvis. Dr. Lee cannot believe but that, if Dr. West had seen the case in the seventh, or even the eighth month of pregnancy, some other course would have been pursued; but Dr. Lee must believe the disease was not recognised. In another case it was known that this disease existed. Mr. Skey operated; and Dr. Lee asked why in this case was not premature labour induced? Mr. Jolin, a surgeon, on seeing the case, detected pregnancy, and the woman's very unfavourable situation. The antero-posterior diameter of the pelvis only being one inch and one-third, no reason was perceived why in this case premature labour was not induced. Dr. Rigby also had seen the case. The woman was kept for three months in St. Bartholomew's Hospital. Dr. Lee did not know why premature labour was not induced in this case, but it appeared to him to have been the fashion to do those grand things; but that he stood there to advocate the cause of humanity. Dr. Lee next mentioned a case where a woman afflicted with mollities ossium was seen during her first pregnancy by several practitioners in Scotland. Dr. Simpson, of Edinburgh, was also sent for, and saw the case. Nothing was done for her; she was allowed to go to the full period. When Dr. Simpson was again sent for, he arrived with needles, sutures, lint, ether (for chloroform was not then invented); but before he reached the patient's house she had been delivered by natural efforts.

Dr. West considered Dr. Lee's statement was a sort of challenge, which required an explanation. He should not like any one to leave that meeting supposing that he was an advocate for the Cæsarean section; and as to the induction of premature labour in this case, he did not see it till labour had set in. The object which he had in bringing the case before the society, was to see if any other course, under the circumstances, could have been adopted, so as to have averted the fatal result. He apprehended that all teachers of midwifery in London taught the necessity of inducing premature labour in such cases, and he should be sorry to sit down supposing that any one believed he underrated the value of the induction of premature labour; but, having found a case like the present one, he was anxious to hear the opinions, as to whether any better treatment could have been pursued, from some of those experienced midwifery practitioners who were present.—*Med. Gaz. Feb.* 7, 1851, *p.* 245.

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## 120.—A CASE OF CÆSAREAN SECTION.

By Dr. Henry Oldham, Lecturer on Midwifery at Guy's Hospital.

The subject of this case was a rickety deformed girl, æt. twenty-three, unmarried, pregnant with her first child, and seven months gone in gestation when first seen by Dr. Oldham. On examination, the pelvis was found to be reduced two inches in its conjugate diameter, and the uterus was much anteverted. The membranes were punctured for the induction of premature labour in a few days after she was seen, September 23d, 1850. On the following morning the left arm was found in the vagina, but labour did not come on until nine A.M. on the 26th. In twelve hours the os uteri was dilated, and then some attempts to deliver her were made. The child could not be turned; but by drawing down the protruding arm, which, from commencing decomposition, soon gave way, and pressing the abdomen from below, the head was

brought over the brim, and was at once perforated. For four hours the crotchet was employed both inside and outside the head, the bones of which were completely torn up; but without drawing it through the brim. At this time a new impediment was found to have arisen, from the descent of the right hand and a foot by the side of the collapsed head into the pelvic brim; and on watching the effect of labour pains, all these parts were felt to be squeezed together in the narrow inlet of the pelvis, each preventing the other's descent. It was attempted to bring down either the foot or hand, but only the slippery tips of each could be touched, and they could not be moved. The patient had now been seventeen hours in labour, and it became a question for serious consideration and consultation, whether she would be able to sustain the necessary efforts for her delivery, and whether it would not be for her benefit to perform the Cæsarean section before exhaustion came on; which at length was determined on. The operation was performed by Mr. Poland without difficulty, and with little hæmorrhage; the patient being under the influence of chloroform. The incision five inches long, was slightly curved, and a full-sized seven months fœtus was removed, and afterwards the placenta and membranes. For two days the patient did well; but then exhaustion came on, and she died. While she lived she was kept under the influence of opium, and was sustained by simple cold drinks. On post-mortem examination there were some slight traces of peritonitis near the uterus. The external opening was closed, and its edges adherent; but the uterine incision was gaping. The larger omentum was indurated and inflamed, and so drawn across the uterus above the incision as to prevent any discharge from the latter organ escaping into the peritoneal cavity.

Two practical questions were suggested by this case—1st. What was the best plan to attempt to follow out in the delivery at first. 2d. Were the complication such as to justify the Cæsarean section.

With respect to the first, two plans of treatment might be adopted:—1st. To induce labour, and deliver by craniotomy. 2d. To allow her to go to term, and then perform the Cæsarean section. In determining in favour of the former, the author was guided by the great probability, with a conjugate diameter of two inches, of being able to deliver with the crotchet; and he considered that his inability to do so arose from the complex presentation.

With reference to the second, he was induced to have recourse to the Cæsarean section, from a conviction that the patient would probably sink under the prolonged efforts at delivery; and a case was related which occured in the Lying-in Charity at Guy's, under Dr. Ashwell, where a woman with a far less contracted pelvis died undelivered, after the most powerful and sustained efforts to relieve her. It was remarked that the girl had but a feeble constitution, which would ill support so hard a trial of its powers; and the condition of the vagina was particularly noticed, as retaining the marks of early age, being structurely weak, and easily lacerable, and most unfavourable for a long craniotomy operation. Under these circumstances the Cæsarean section offered a speedy and sure, instead of a prolonged and doubtful delivery; it was not yet forbidden from exhaustion or any signs of inflammation; on the score of suffering it contrasted most favourably with the persistence in the use of the crotchet; and, upon the whole, it was judged to offer a better chance of ultimate success.

The curve in the incision was suggested to catch the outline of the muscular fibres on the inner surface of the uterus, and so favour the closure of the wound. The scanty hæmorrhage in the operation was in a measure accounted for by the uterus being at the seventh instead of the ninth month; by the placenta being attached to the posterior wall, and the uterus being opened low down towards the cervix where the veins were less developed. Chloroform was said to be a gain in every way, and the after-treatment by opium appeared satisfactory.—*Med. Gazette, February* 21, 1851, *p.* 338.

## 121.—ON FIBROUS TUMOURS.

By George Murray Humphry, Esq.

[With the exception of the fatty, the fibrous are perhaps the most common of the simple growths. They resemble the natural fibrous tissue as found in areolar membrane, in ligaments, tendons, &c. Their microscopical examination is also distinctive. In some instances, the fibres are disposed more or less concentrically. These tumours generally do not attain to a very large size. In other instances, the component fibres interlace in a complicated irregular manner. These kinds may attain to a very large size; they are commonly round. In a third, but more rare class, the tumour consists of an aggregation of small nodules, or masses closely compressed together, having an uneven, knotty outline, and looks like a conglomorate gland.]

When you examine fibrous tumours with the naked eye you may observe that many or most of them consist of two structures; viz., dense, opaque fibres, or bands, coursing about and interlacing in the midst of a more clear, hyaline, softer substance; the latter being contained in the meshes formed by the interweaving of the former, much in the same way that the fatty is related to the fibrous element of an adipose tumour. The actual difference between these two components of fibrous tumours seems to depend upon the larger quantity of fluid—serous or aqueous fluid—which exists in the softer substance; and the proportion which this substance bears to the rest of the mass varies exceedingly. In some instances it is scarcely perceptible, the tumour appearing to consist almost entirely of the tough, opaque, fibrous element; in others the latter structure forms but an insignificant part, or may not even be distinguished at all in the soft, succulent, cellular mass of which the tumour consists. When a tumour of this latter kind is opened, and the fluid allowed to drain away, the mass shrinks, and soon loses a half or two-thirds of its weight. Now and then the fluid is contained in distinct cysts with smooth walls, lying in the interstices between the interlacing fibres; thus constituting one of the forms of "sero-cystic sarcoma." I have already suggested the probability that these cysts are formed by an enlargement and alteration of the cells of the areolar tissue entering into the composition of the tumour, in the same manner as ganglion, supplementary bursæ, and other serous cysts of the like kind.

In by far the greater number of cases fibrous tumours are invested with distinct capsules of compressed areolar tissue, which surround them on all sides, and isolate them from the surrounding structures. In some instances no such bar of separation exists; on the contrary, there may be a manifest continuity between the tumour and the tissue in which it is imbedded, affording great probability that the one has originated in a morbid or hypertrophied condition of the other. Such is the case with some of the uterine tumours to which I shall presently direct your attention.

Fibrous tumours vary so much in the compactness of their structure, and the mode of arrangement of their fibres, that in the classifications of tumours made by Abernethy and succeeding pathologists, the several members of this class were arranged in separate divisions. The name "cellular sarcoma," or "vascular sarcoma," was given to those in which the structure was soft and succulent, resembling the common cellular tissue, the chief bulk and weight of the mass being dependent on the larger quantity of fluid contained in the spaces between its solid elements. Tumours of this kind grow, as we might expect from their structure, more quickly than the other varieties of the class; they are found generally in parts where the cellular tissue is naturally lax and abundant—in the scrotum for instance, and in the labia pudendi, occasionally in the ovary, or in the cellular tissue surrounding the lower part of the uterus and the vagina. They are generally invested with a thin capsule, which separates them from the surrounding parts; their connections are loose, and though they may attain very large size, they are easily dissected out. The capsule is not, however, always present; on the contrary, the tumour may be blended with the surrounding cellular tissue, so that it is not easy to define its limits very clearly. Those enormous tumours of the scrotum which are occasionally met with in this country, and are more common in warm climates,

appear to be of this nature, and they serve to illustrate the opinion I have expressed with regard to the nature of tumours generally, for they evidently consist of a thickened condition of the cellular tissue of the scrotum, excited, perhaps, by chronic inflammation, or some long-continued irritation, or they may take place without any obvious cause.

The testicles and penis are commonly buried in these masses. Sometimes the skin is affected in a similar manner, becoming greatly thickened and tuberculated, so as to present the usual appearance and characters of elephantiasis. When an incision is made into a scrotum thus diseased, a large quantity of serous fluid drains away, and the size of the mass soon diminishes. I have occasionally met with ill-defined tumours under the skin of the face and in other parts of the body, which I could account for only on the supposition that they depended upon a hypertrophic condition of a small portion of the subcutaneous cellular tissue. You will perceive that there is a near relation between tumours of this kind and that thickened condition of the areolar and fibrous tissues which occurs in warts, polypus, pterygium, and the like; indeed, we cannot draw any clear line of distinction between them.

Another species of fibrous tumours has been called the "mammary sarcoma," from the resemblance of the tumours to udder; their fibres being interwoven so as to form a toughish, doughy, pale mass, intermediate in consistence between the cellular sarcoma and the tumours next to be described. The specimens of mammary sarcoma are generally found in the neighbourhood of the breast; they have been known to attain a very large size, and are usually capsulated.

The third species of fibrous tumours, which is by far the most common, and in which the characters of the class are most strongly marked, was not distinguished by Mr. Abernethy with a particular name. These tumours are remarkable for their great hardness, and on this account are very often described under the name "scirrhus," a word which has been so indiscriminately used in former times as to have retained hardly any definite meaning at all, but which is now by all accurate pathologists applied exclusively to one of the varieties of cancer; they are more frequently found in the uterus than in any other part of the body, and were described by Dr. Baillie under the name of the "fleshy tubercle of the uterus;" the term "fibro-calcareous" has also been applied to them, because of their liability to undergo calcareous degeneration, a peculiarity which I believe is not shared by either of the other varieties of fibrous tumours.

In each of these species there is a general correspondence to be remarked between the characters of the tumours and those of the tissues in which they grow. Thus the soft, succulent, "cellular" tumours are found in the loose cellular tissue of the scrotum; the "mammary" tumours are found in or near the breast; and the last variety, the "fibrous" tumours—strictly so-called—are found in the uterus, among tendinous structures, in the periosteum, and in the dura mater.

The characters of these three species of fibrous tumours are so far distinct that I have thought it worth while to direct your attention to them; at the same time you should know that the intervals between them are filled up by intermediate gradations, just as it is in natural structures with regard to the areolar and fibrous tissues. Here, for instance, is a round tumour growing in the tough cellular tissue which forms the soft strong padding at the extremity of a finger: it is scarcely hard enough to belong properly to the third species just mentioned, yet it is too firm to be classed with either of the other two; and you will find many specimens not strictly included in either of these species, but serving to connect them more closely together.

You will obtain a more clear idea of the general characters of fibrous tumours, and the changes they undergo, if I give you a description of them as they affect the uterus. They are found in this organ more frequently than in all the other parts of the body; they occur in the body, the neck, and the os; very often in the former, comparatively seldom in the latter. The tumours are seen lying beneath the peritoneal and mucous coats, as well as at various points in the thickness of the uterine wall. They are for the most part very

firm, or even hard; and the sections show the closely-compressed, opaque, wavy fibres, in great numbers, coursing about in various directions, interlacing and enclosing, in the small intervals between them, some clear, vitreous substance. The fibres are packed together so closely that it is difficult to separate them from one another; and they form compact heavy masses. The tumours are generally round; when single they are so almost invariably; when two or more exist together their shape is altered by mutual pressure. Often they exist in considerable numbers, compressing one another, and converting the uterus into a lobulated misshapen mass, which may be so large as to exceed the size of the organ at the full term of pregnancy. They exhibit scarcely any traces of vascularity; indeed, vessels can seldom be detected in them, although the uterus may have been minutely injected; neither is there any preternatural vascularity in the surrounding uterine tissue. The tumour is surrounded on all sides by a capsule of areolar tissue, from which delicate filaments pass into its substance, and form the bond of union between the two. These filaments are easily torn, and the tumour may without difficulty be enucleated or turned out of its capsule. Towards the exterior the structure of the capsule becomes gradually more coarse, and at last its fibres are blended with those of the uterine tissue. The wall of the uterus is stretched over the tumour, and, as already described, is very often thickened at the same time. Various changes also are produced in the uterus, according to the size and position of the tumour. In some instances it is greatly elongated, perhaps curved at the same time; or it may be shortened and spread out. In one of these specimens the Fallopian tube is so stretched as to be eleven inches long, though it still retains its natural thickness.

When the tumour is situated near the exterior of the uterus it projects into the abdominal cavity, carrying before it the peritoneum, together perhaps with a thin layer of uterine tissue. In process of time the tumour, gradually projecting more and more, may become pediculated; as in this instance, where a large fibrous tumour hangs from the left cornu of the uterus by a pedicle thinner than one's little finger. Under such circumstances the tumour is likely to contract adhesions to the adjacent viscera, and in some instances it has been known to be quite detached from the parent organ and transplanted as it were to a new soil. When this has taken place, I believe the tumour always ceases to grow and becomes calcified.

In like manner, when the tumour is situated near the internal surface of the uterus it projects into the cavity of the organ, carrying before it the mucous membrane, with perhaps a thin layer of uterine tissue. As it increases it projects more and more into the uterine cavity, where the resistance is least, its basis of attachment to the uterus gradually narrows and at last forms a mere pedicle. In this manner is formed the *fibrous* polypus which differs from the *mucous* and *uterine* varieties of polypus described on a former occasion, inasmuch as it is the result of a fibrous tumour forcing its way into the cavity of the uterus.

According to the views of the nature of tumours which I have given you, it really differs from that which is called the 'uterine' polypus less than is generally supposed. As the tumour grows it distends the organ, which increases in size and in the thickness of its wall as much as it does in pregnancy. Gradually the cervix becomes widened as well as the body, and in course of time the tumour presents at the os uteri, which dilates so as to permit it to pass into the vagina. The comparatively unsupported weight of the tumour now dragging on the pedicle, causes its further elongation, so that the body of the uterus becoming thereby rid of the mass, is able to return to its natural contracted state, while the os and cervix remain expanded over the upper surface of the tumour, as they had before embraced and supported its lower end. So long as the tumour remains in the body of the uterus and is supported by the os and cervix, its pedicle does not undergo much elongation; indeed, it appears that while the tumour is in this position, it does not generally become pedunculated at all, though some specimens in the College of Surgeons and in other museums, show that it may do so occasionally. After it has reached the vagina the pedicle soon becomes narrowed and may even give way, allowing the

tumour to escape and affording a spontaneous cure of the disease. Fibrous polypi grow generally from the fundus of the uterus and by their weight dragging upon this part, may cause inversion of the womb: even a small tumour has been known to produce this effect, owing probably to the expulsive action of the organ induced by it.

A fibrus polypus consists, therefore, of a fibrous tumour, which, projecting into the interior of the uterus, has become pedunculated. It corresponds in structure with the fibrous tumours growing in other parts of the uterus, though I think its structure is not generally quite so dense. It is covered by the mucous membrane of the uterus reflected over it, together perhaps with a thin layer of uterine tissue; these converging at the upper part of the polypus, pass from it to the uterus, and constitute the pedicle, which is generally narrowest at the middle, expanding below over the polypus, and again expanding above where it is connected with the uterus. The pedicle thus consists entirely of stretched uterine structure, forming, in reality, no part of the polypus, which explains the fact of its not being necessary to remove the entire pedicle in order to prevent a return of the disease after operation. The mucous membrane covering the polypus is sometimes very vascular, so as to bleed profusely when it is lacerated or superficially ulcerated. This was the case with a patient lately in the hospital, who had been greatly reduced by repeated hæmorrhages and continual oozing of blood from the vagina; on examination I found a fibrous polypus presenting at the os uteri, and the lower end of the tumour rough from superficial ulceration. The os was sufficiently dilated to permit the introduction of the finger and Gooch's canula, with the assistance of which the tumour was tied at its upper end, and the patient quickly recovered.

Under ordinary circumstances fibrous tumours occur in considerable numbers in the same uterus; in some of these specimens there are five, six, or even more, indeed they are rarely single, except when they project into the cavity of the uterus, and distend its walls; there is then commonly only one tumour. This exception is a matter of some practical importance, inasmuch as it gives us greater confidence that we may be able to effect a permanent cure by our operations upon polypi, and that the patient will not be troubled with relapses from the presence of other tumours. I do not mean to say that such is invariably the case, for you will every now and then meet with an instance of fibrous polypus, associated with fibrous tumours in other parts of the uterus, and such a coincidence may be adduced as an argument in favour of the view which regards the polypus to be of the same nature with the tumours, but it is certainly not the general rule. I am not aware that this observation has been made by other writers on the subject. The only explanation I can offer of it is, that the distention to which the uterine structure is subjected from the formation of one tumour in its interior, is not favourable to the growth of others in its wall; for the same reason we find that new growths do not occur in the stretched uterine tissue surrounding a tumour so often as in other parts of the organ.

In the greater number of cases the fibrous tumour in the uterus consists, as I have said, of a firm globular mass growing from one centre without any peripheral processes or lobes; this, however, is not their constant character. Sometimes there are several nuclei, forming distinct masses, closely packed together. Here is a specimen of an uneven, granulated, or finely lobulated tumour in the fundus of the uterus, which appears to consist of a number of separate masses less closely packed; it looks something like a salivary gland, but is of firmer structure.

Again, fibrous tumours are generally distinct from the surrounding uterine substance, and separated from it in their whole circumference by a well-marked capsule. Exceptional cases, however, do occur, in which the line of demarcation between the tumour and the uterine tissue is less marked, in which the tumour manifestly consists of an altered state of the uterine tissue, and in which the tumour enlarges, partly at least, by an extension of that altered state to the peripheral structure. In this specimen the tumour consists of a thickened, coarse, hypertrophied state of one side of the fundus uteri. Rarely is the os uteri the seat of fibrous tumour at all, but

when it is so the tumour, so far as I have been able to ascertain by the examination of specimens in different museums, consists of an enlargement of one or both lips of the os uteri, the posterior lip being most frequently affected. The tumour thus formed partakes of the usual characters of fibrous tumours, except in the continuity of its structure with the uterine tissue: it may attain to a very large size, filling the vagina, or even projecting externally. In the museum of St. Bartholomew's Hospital is a specimen showing the whole circle of the lower end of the uterus enlarged into a fibrous tumour which projected into the vagina and encloses the aperture of the os in its centre.

All the changes to which fibrous tumours are liable may be observed in those affecting the uterus. They are,—calcareous degeneration, softening, and the various effects of inflammation.

Calcareous degeneration commences with the appearance in the substance of the tumour of one or more small grains of hard straw-coloured substance, consisting of carbonate, with some phosphate of lime. They are generally near the centre of the mass at first, and gradually extend towards the circumference; they increase at the expense of the fibrous structure and are evidently the result of a transformation of it—a conversion of the fibrous into earthy matter—perhaps bearing some analogy to the gradual ossification of cartilages and ligaments which goes on in declining years; though it is to be remarked that the grains of earthy matter do not seem to be disposed in any definite orderly manner, at any rate the masses composed of them do not show anything like so complicated a structure as we find in bone. The change must be regarded as an evidence of degeneration rather than of advancing development, and the term calcification or calcareous degeneration is, therefore, more appropriate to it than ossification. In course of time the earthy grains enlarge and coalesce, forming very hard, branching, knotty masses, like coral, of straw-colour. They are closely connected with the remaining substance of the tumour, indeed they are continuous with it, so that they cannot be cleaned without great difficulty, or the help of maceration. Such masses may attain to considerable size, involving the greater part of the tumour, but they generally contain enough of the fibrous structure in their interstices to disclose their real nature. In a few instances the calcareous degeneration has commenced upon the surface of the tumour, and I have seen one case in which it had converted the outermost layers of the tumour into a hard shell, enclosing the central part like a kernel. It may take place in the tumours which project into the peritoneal cavity, or in those which hang polypose into the uterus; but I have not met with an instance in which it affected a tumour formed by the hypertrophy of an appreciable portion of the uterus, such as these originating in the os uteri just mentioned. Neither have I known it to occur in the cellular tumours, in the mammary sarcoma, or in any of the softer varieties of fibrous tumours.

Softening appears to take place in two ways: first as a chronic process, affecting some circumscribed portion of the tumour, which is usually at or near the centre. The change is observed to commence with a slight discolouration —a yellowish or dark tinge—which is followed by a loosening or incipient disintegration of the structure; at the same time a line of demarcation is formed round the altered portion, which becomes separated like a sequestrum from the surrounding mass. Both the detached portion and the cavity are at first rough and shreddy on their opposed surfaces; the former undergoes still further disintegration and solution, becoming broken up into a number of small fragments, which float about in a dark, dirty, turbid fluid, and which may, ultimately quite disappear. The several stages of this process are remarkably well shown in different tumours of the same uterus by a specimen in the pathological museum of Guy's Hospital; and there is in the museum of St. Bartholomew's Hospital a fibrous tumour of the uterus, which seems at one part to have undergone the changes just mentioned, for it contains near the centre a circumscribed cavity, with a flocculent lining composed of the partially disintegrated structure of the tumour. This cavity is said to have contained a serous fluid, so that if it were formed in the manner I have suggested, a portion of the tumour must have undergone absorption as well as complete solution.

The process of destruction may go on in the adjacent portion of the tumour, enlarging the central cavity, till the whole is reduced to a fluid or semifluid mass walled in by the cellular capsule of the tumour, which now stands in the relation of a cyst-wall to the disorganised contents. Uterine tumours, which have undergone this change in a greater or less degree, have more than once been mistaken for ovarian cysts, and tapped accordingly. There is a specimen in the museum of the College of Surgeons, with a history appended, to the effect that an encysted tumour formed in the uterus, and the patient was twice tapped and the cyst emptied, the disease having been supposed to be ovarian dropsy during life; it was, probably, a case of the kind I am now describing, if we may judge from the appearance of the sac, and from the knowledge that cysts are very rarely produced in the walls of the uterus. In some instances the softening process is completed at one spot without extending to the circumference: the ragged processes hanging into the interior of the cavity are removed, the latter acquires a smooth lining, and looks like a simple cyst lying in the substance of the tumour. You must not mistake for cavities thus formed, the vacancies occasioned by enucleation of portions of the tumour after death. It is necessary to give you this hint, because I have known such an error to have been made.

The second mode in which softening takes place is more rapid and more diffused: the whole or greater portion of the tumour being affected at once. The change commences with the infiltration into the mass of a serous fluid, whereby its texture is loosened, and its components separated; at the same time the tissue of the tumour is softened, and interstitial absorption is set up in it. As the result of these processes combined, the tumour is soon broken up into detached fragments, and reduced to a diffluent pulp, or, it may be, completely liquefied. It may even burst into the cavity of the uterus or the abdomen, and its contents be discharged. These changes are probably occasioned by some altered state of nutrition analogous to inflammation; they may be induced by an accidental cause, an injury, or pregnancy, and purulent fluids are sometimes found mixed up with the softened substance of the tumour. Nevertheless, they are not necessarily attended with any constitutional disturbance at all corresponding with the extensive destruction which is in progress.

The solution and absorption of the detached fragments of a tumour in the manner just described reminds us of the changes observed to take place in a cataract after the capsule of the lens has been opened; and they are interesting phenomena in relation to the much disputed question of the possibility of corresponding processes taking place in a sequestrum after necrosis of a bone. There can be no doubt that they are the result of some forces existing in the detached fragments, and not of any absorbing or corroding influence exerted upon them by the surrounding tissues: neither are they simply of a chemical nature, like the decomposition which takes place in the dead body; nor are they the consequence of a peculiar quality of the fluid infiltrated into the substance of the tumour, for there is no evidence that the fluid is endued with any qualities likely to lead to a result of that kind, and there is every reason, from analogy, to reject such a supposition.

It seems most probable that these changes are of a nature nearly allied to those by which the effete, worn out particles of the living frame, are reduced into a fluid state, and returned into the circulating current. Although the detached fragments have no longer any physical connection with the surrounding tissues, they are probably not altogether disconnected from their vital influence. Such a vital influence operating from one tissue upon another, with greater or less degree of force, is universal in the animal machine. Emanating from the vessels it operates upon the blood circulating through them, preventing its coagulation, and facilitating the elaboration of its components; it prevents the decomposition, and assists in the solution and absorption of the blood extravasated among the tissues; in like manner it prevents the decomposition of the contents of abscesses and cysts, which sometimes remain stationary for years, as well as of fibrinous masses, floating about in the fluid of ascites. It is shown in a still more remarkable manner in those cases where a fœtus retained in the body for years has become dry and encrusted with a shell of cal-

caseous matter. In all such cases a total loss of vitality is prevented, and the operation of the ordinary laws of nature is restrained by the contiguity of the living tissues. It is more than probable that the same influence regulates the changes that occur in the detached portions of a tumour, and it is not improbable that it has also some effect upon a sequestrum of bone, leading to its partial or even complete removal. It is difficult to prove in the latter case that this really takes place, but I think there are sufficient reasons for admitting it; the appearance, size, and shape of the sequestra, the roughening of their outer, and the removal of the cancelli from their inner surfaces, are sometimes such as most easily admit of explanation on this supposition. The influence upon which these effects depend is of course most likely to exert its power while the external air is excluded: indeed it can scarcely be expected that any change should take place in a detached portion of bone after the abscess connected with it has burst.

Suppuration has been now and then known to take place in a fibrous tumour, and ulceration sometimes extends into it after penetrating its coverings, as in the case of polypus. Here is a specimen of large fibrous tumour of the uterus, projecting into the peritoneal cavity, and covered with a coating of cancer, which was diffused over nearly the whole interior of the abdomen. At one part you may see that the cancerous disease has penetrated the tumour, and destroyed its substance for about an inch. Dr. Lever, in his work on diseases of the uterus, relates a case where melanosis was deposited in the structure of a fibrous tumour.

We cannot say that these tumours are attended with any particular train of symptoms, they have hardly any nervous link connecting them with the rest of the body. The drain upon the vascular system, occasioned by them is scarcely appreciable, neither do they return to it any noxious element, or communicate an evil influence in any other way. The symptoms to which they do give rise are almost entirely dependent on their effects upon the neighbouring organs and tissues, and therefore vary with their position. Thus, if they be placed near the lining membrane of the uterus they occasion the several symptoms of chronic inflammation of that membrane, such as uneasiness, discharges of mucus or blood, with, perhaps, the pains of forced uterine contractions, sensations of weight, bearing down, &c. When situated more in the middle of the uterine wall, or nearer to its external surface, they may exist for a long time, and attain considerable size, without giving any indication of their presence. In some cases, by their pressure upon the rectum or bladder, they occasion an irritable disordered state of these organs, or difficulty in voiding the urine and fæces. These and other symptoms of the like kind are rather casual results of the tumour's relation to certain external parts, than of any intrinsic quality of its own.

The fibrous tumours of the uterus become the subject of treatment only when they grow from the os uteri, or when they project into the cavity of the uterus and the vagina, assuming the polypose form. In either case they may be removed by ligature, or if their pedicles be narrow, may be excised, as recommended and extensively practised by Dupuytren. In a few cases an incision has been carried through the coverings of a fibrous tumour, projecting into the cavity of the uterus or vagina, but not become polypose, and attempts have been made to turn the mass out of its bed by dissection, and by tearing the fine filaments which unite it to its capsule. This proceeding, though successful in a few instances, is for obvious reasons seldom to be attempted. The application of iodine externally, and its internal administration, has been recommended with the view of promoting the absorption of these tumours, and is said to have been attended with success. I have seen it tried in a few instances, but the result has not been encouraging.

Fibrous tumours affecting the bones are usually found upon those of a spongy nature, upon the ends of the long bones, the phalanges, pelvis, and lower jaw. So far as I have seen, they are confined to the *exterior* of the bones, growing from the periosteum, and creeping along the surface of the bone in such a manner as to prove almost to a certainty that they originate in some morbid condition of the periosteal fibres. In the museum of the College of Surgeons there

is a specimen of a tumour said to be of fibrous nature, and supposed to have commenced in the *interior* of the femur; but the characters of the tumour approximate more to those of a cancerous than a fibrous growth, and it is not now easy to tell at what part of the bone it originated. The bones underneath these tumours may suffer absorption, in consequence of the pressure produced, but do not seem to be affected in any other way. They appear upon the maxillary bones more frequently than upon any other part of the skeleton. On the lower jaw they spread along the ramus, encircling it beneath and on the sides; so that the bone is almost concealed by the tumour. In some instances they form within the substance of the jaw, probably from periosteum lining the sockets of the the teeth, and as they increase the walls of the bone become spread out over them. They grow up around the teeth, and, where they project into the mouth, may be soft and fungous. In the upper jaw they form now and then in the antrum, and gradually distend the walls of the cavity; more frequently they commence on the outside, and grow along the surface of the bone, projecting into the mouth, nose, orbit, and towards the cheek, so that the natural outline of the maxilla can scarcely be recognised.

In some instances these fibrous tumours of the jaws have exhibited a semi-cartiliginous structure; and now and then fibres, or plates of bone, are formed in various parts of them. The progress of the disease is well illustrated by the series of tumours of the jaws in the College of Surgeons, from the museum of the late Mr. Liston. These preparations furnish ample proof, if proof were needed, of the skill of that illustrious operator; they show also how necessary it is to bear in mind the mode of growth of these periosteal fibrous tumours of the jaw; because from their disposition to creep along the surface of the bones, they are liable to return after removal, unless the immediately adjacent as well as the affected part be excised. The histories attached to the specimens teach us that very large fibrous tumours, both of the upper and lower jaw, together with the bones on which they grow, may be removed successfully.

Nearly allied to these tumours of the periosteum, and forming a close connecting link in pathology between them and the common warts and polypi, are the tumours of the gum called "epulis." They are of two kinds; one consisting of a red granulated or nodulated growth springing from the sockets of the teeth, originating apparently in a morbid condition of the membrane lining the sockets, and caused in many instances by a diseased state of the teeth. Such a growth requires to be extirpated, and it is not enough simply to slice off the tumour, for it is deeply rooted and will most likely re-appear unless the aveolus from which it springs, be removed with it, which may easily be done by cutting a notch in the jaw with the bone forceps or a small saw. The second kind of epulis is exemplified by this specimen of tumour of the gum on the outside of the upper jaw; it is a red, soft, pulpy growth, as large as a walnut, in appearance resembling swollen gum; indeed it consists evidently of a growth of the gum. It is slightly lobulated on the surface, and tolerably defined at the circumference, where it is continuous with the surrounding gum. The patient was a healthy young woman, and the disease had been observed to follow the extraction of a tooth six months before she came to the hospital. The tumour was closely connected with the bone, so I removed the portion of the maxilla on which it rested, including the sockets of the canine and first molar teeth. Seven years have now elapsed since the operation was performed, and the patient is still quite well. The tumour was very vascular, bled frequently and might have been mistaken for a malignant affection. Its cut surface shows an indistinctly fibrous structure; the bone beneath is rough and somewhat absorbed in consequence of pressure, but is in other respects healthy.

Fibrous tumours are not uncommouly found in nerves. In some cases they form distinct round masses within the neurilemma. In others they appear to consist of an increase of that fibro-cellular tissue which unites the nervous filaments together; for the filaments are intermixed with the substance of the tumour, which in its general character, and probably also in its essential nature, closely resemble the knots which are so common at the divided ends or

wounded points of nerves. These tumours are in some cases attended with a good deal of pain, felt in the course of the nerves and easily exited by pressure, a slight blow, or a quick movement. Excision is the only remedy, and it must in each case be uncertain how far it will be possible to effect that without injuring the structure of the nerve. Not long ago I removed from within the sheath of the medium nerve near the wrist, from a woman aged forty-eight, this spherical tumour; it is as large as an orange, presents a semi-opaque glistening appearance, not unlike brawn, with more opaque yellow spots interspersed here and there. It resembled some of the varieties of encephaloid disease so closely that I should have been apprehensive as to the result had it not been gradually forming many years, during which time the woman enjoyed good health. It was attended with a good deal of pain and a shrivelled state of the fore and middle fingers. Some filaments of the nerve were removed with the tumour, nevertheless, the patient recovered completely, regaining the use of the hand; the fingers were also in course of time restored to their natural condition.

It has already been intimated that fibrous tumours occur in several other parts of the body besides the uterus, the periosteum, and the nerves. Here is one as large as a walnut and of spherical shape, growing from the inside of the dura mater, and causing an indentation in the surface of the brain. Sometimes they form in the substance of the testicle, the prostrate gland, the ovary, and even the walls of the alimentary canal. Very rarely are they to be met with in any other of the internal organs.

One point more requires to be specially mentioned in relation to these growths; viz., their occasional liability to return after they have been to all appearance completely extirpated. Where this has taken place the tumour has, I believe, generally grown quickly in the first instance, has been composed of several detached portions, of which one or more may have been left behind in the first operation, or has consisted in a thickened morbid condition of the tissue in which the growth occurs, affecting a considerable area and probably not having such definite limits as these growths usually present. To the latter circumstance I have already directed your attention in speaking of fibrous tumours of the periosteum, and have said that the same feature is to be observed in some of the adipose tumours, more particularly those under the skin. Whether these qualities are to be regarded as constituting an approximation to growths which we call malignant, must remain a question till we are all able to define more clearly the real nature and characters of that class of diseases.—*Prov. Med. and Surg. Journal*, *Nov.* 27, 1850, *p.* 645.

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## 122.—FIBROUS TUMOUR OF THE UTERUS IN CONJUNCTION WITH PREGNANCY.

By Dr. Robinson.

A woman, æt. 40, pregnant with her third child, was confined at four o'clock in the afternoon. The labour was in every respect natural, and the womb contracted well. Two hours afterwards she was seized with cold chills; and, upon being put to bed, was sick and faint. When seen five hours and a half afterwards, she was in a state of complete collapse. Fearing internal hemorrage, and not being certain about the state of the uterus, the hand was introduced. The uterus was found empty, but flaccid. By cold, pressure, maintaining the hand in the uterus, brandy, and laudanum, contraction of a feeble kind was produced, and also a somewhat improved condition of the system generally. She rallied a little, but never fairly got out of collapse; she lived ten days, and died apparently from atonic peritonitis.

Upon dissection, the intestinal convolutions were of a dark colour, being smeared with blood, and were united to each other and to the uterus by recent and easily separated adhesions. There were three pints of dark venous blood without coagula in the peritoneum, and the tumour, in size and shape like a placenta, attached to the fundus of the uterus; this was covered with peritoneum and reflection from the uterus, and at the angle of reflection it was lacerated to the extent of two inches.

In his observations the author alluded to the uniqueness of the case—to the structure, situation, and growth of the tumour. It seemed as if a malignant character had been implanted upon that originally fibrous. As regards situation, he thought, had the woman not been pregnant, it was the most favourable, and would have produced little inconvenience. He thought also that the tumour, originally of small size, grew with the uterine development. He ascribed the laceration to the tumour being entangled in the convolutions of the intestine, not following the uterine contractions so freely as was necessary; the peritoneum being thus put upon the stretch, and, by the recurrence of pain, giving way.

He drew a contrast between this and another case of laceration of the peritoneum which occurred to him, which has been published, and in which death occurred in twelve hours; and thought the difference in the treatment adopted might have accounted for the difference of time at which death occurred; and, in conclusion, alluded to the fear of rupture of the peritoneum as an additional reason for resorting to the induction of premature labour.

[Should premature labour be induced in all cases of tumours of the uterus?]

Dr. Reid had attended a case where there was fibrous tumour of the uterus, and the lady had been pregnant two or three times; and, although she had suffered considerably during each pregnancy, yet no bad symptom occurred either before or after labour. She had been delivered of twins, and no peritonitis followed. He (Dr. Reid) would not interfere too much in such cases to induce premature labour.

Dr. Oldham said he had examined the preparation of the tumour in Dr. Robinson's case, and would make a difference of opinion respecting it. It appeared to him a fibrous tumour enlarged by gestation, and the blood vessels surrounding it seemed to form a kind of cortex, or shell, they being enlarged by pregnancy; and, as to the cause of rupture, confessed he did not quite concur with him that it was caused by the hanging of the tumour amongst the intestines, there not being sufficient adhesions to account for the resistance; but supposed that, when the uterus suddenly contracted after the removal of the placenta, a great amount of traction would take place just at the angle of reflexion. That this kind of laceration sometimes takes place independent of tumour, from the peritoneum undergoing change, and lacerating the tumour, would favour the tendency to rupture. He then mentioned some cases of fibrous tumours which came under his own observation, one of which occurred in the midwifery department of the hospital, so apparent that the students examined it without any inconvenience to the patient: the pedicle in this case was more slender and moveable than in Dr. Robinson's case; but in none of his cases had he thought of inducing premature labour. Had the tumour been in the cavity of the uterus, progressively increasing, threatening hemorrhage of the uterine veins, some other line of practice might be indicated: but in his cases they were not likely to interfere. One of the pupils had attended the last-mentioned case: the woman was delivered of twins, and no evil result followed.

Dr. Lee had met with an instance in which a tumour enlarged to such a degree as to lie in the way of the child's head, and acted similar to deformity of the pelvis. He had performed craniotomy in such cases, and would treat a case of tumour low down in the pelvis like a case of deformed pelvis. These tumours occupy different situations, in some instances strictly resembling polypi, and, when obstructing the orifice of Fallopian tube, causing sterility. When situated midway, but not interfering with this tube, abortion will result; but when the tumour is situated under the peritoneum, it rises upwards, and pregnancy may take place. Unless where it grows rapidly, he considers the induction of premature labour would be unjustifiable: has seen cases in which the walls of the uterus became softened, and death arose from a low form of puerperal fever: had seen no case of rupture in such cases. He said of late a considerable degree of interest, although not of much practical importance, had risen as to the diagnosis of this sort of tumour and ovarian cystic tumours. A case had occurred in which, some twenty-five years since, Mr. Lizars, of

Edinburgh, was about operating, but, on cutting down, found the tumour adherent to the abdominal walls. This patient recently died, and blood-vessels of large size were found passing from the tumour to the omentum, showing the impossibility of operating. Dr. Simpson, of Edinburgh, had pronounced the tumour ovarian before seeing the ovaries, which were in a perfectly healthy state. A diagram, showing the vessels passing from the tumour to the omentum, was brought before the Society.—*Med. Gazette, Jan.* 24, 1851, *p.* 156.

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## 123.—ON THE TREATMENT OF REMITTENT MENSTRUATION BY SULPHATE OF QUINA.

By Dr. Edward John Tilt.

[Dr. Tilt says he uses the term remittent here in the same sense as in the pathology of fever. This variety of menstrual derangement being characterised by a change from the habitual type to some other, so that the menstrual periods are brought nearer, and tend to run into each other. The first case occurred in a tall slender woman, aged twenty-nine. In this case menstruation commenced between fourteen and fifteen, and continued regular until six months since, when she left her native country, Lincolnshire, for town. For two months, although she menstruated as usual, she was troubled with leucorrhœa between each menstruation. The menstrual periods then came on every fortnight and lasted eight instead of five days. Although she had tried several practitioners, the disorder remained the same, and, continues Dr. Tilt,]

On the 25th of October she applied to me at the Paddington Free Dispensary. The patient was weak and exhausted, but not chlorotic; she had just passed a menstrual period; there was an absence of pain and of other symptoms of uterine disease; therefore, notwithstanding a discharge of which she complained, I omitted all *local* treatment, and ordered the following pills and mixture:—sulphate of iron, two scruples; sulphate of quina, ten grains; extract of hyoscyamus, a scruple: mix for twenty pills, one to be taken night and morning. Camphor mixture, six ounces; liquor potassæ, four drachms; tincture of hyoscyamus, six drachms; tincture of cardamons, two drachms. Half an ounce to be taken thrice daily. An opium plaster to be applied to the pit of the stomach.

The patient's general health improved, menstruation returned to its wonted type, and from that time she only took one pill every night, until the approach of the ensuing epoch, which passed on as it ought to do; and the patient was discharged on the 26th of December.

Miss M. A. L———, aged sixteen, with dark hair, grey eyes, slender, and of middling height: has lived in town all her life. She first menstruated between fourteen and fifteen; and regularly, for four months after its first appearance, did menstruation adopt the monthly type. Since seven or eight years of age she had been subject to leucorrhœa, which for the last three months has preceded and followed the menstrual flow; the latter has made its appearance every fortnight. Still there was no intermediate leucorrhœa; there were no pains in the back, none in front, and none were determined by pressure on the abdomen; but the thighs were so painful that she could scarcely walk, and her legs were at times much swollen. For this symptom my opinion was requested by her mother. The girl had very much fallen off, was much debilitated by loss of blood, and the undue influence of the genarative organ on her system had caused catamenial headache, heaviness for sleep, momentary loss of her senses, and often fits of lowness and shedding of tears.

I thought I could safely promise a speedy return to health, and I ordered the following pills:—Sulphate of quina, ten grains; extract of gentian, a scruple; extract of aloes, ten grains; extract of hyoscyamus, a scruple. Mix for ten pills, one to be taken night and morning. I prescribed the compound camphorated mixture, and belladona plasters to each of the ovarian regions.

The symptoms rapidly abated, and menstruation was forthwith brought back to its original type.

The preceding cases are, in my opinion, samples of an idiopathic aberration

from the normal type of menstruation. and perfectly independent of any *inflammatory* lesion of the ovaries or uterus. They are illustrations of similar cases which have come under my care—cases in which various preparations of steel had been fruitlessly tried, and which soon yielded to the use of sulphate of quina alone, or in combination with other remedies; and I therefore strongly recommend this practice to the profession, premising that the treatment will not be so rapidly effectual, and may even be attended by mischief, if the remittanee of the menstrual flow depends, as it sometimes does, on ovarian or uterine subacute inflammation, as in the following case:—

Eliza H., aged twenty-one, of florid complexion, full habit, and of middling stature, applied to me at the Paddington Free Dispensary for relief. For the last two years she had been living in London, menstruation first appeared between thirteen and fourteen, became regular from the first, was very abundant, and lasted five days at each period.

A few months ago, the patient was attacked by a severe cold with fever, which stopped menstruation for two months. When the latter returned it was scanty, and accompanied by more than usual pain in the back, the stomach, and head; and, attended by these symptoms, it made its appearance every three weeks instead of every month, giving rise also to sensations of weakness, trembling, and lowness of spirits, with which she had previously been wholly unacquainted.

The patient localized her pains in the ovarian regions; pressure increased them, so did walking or any unusual exertion; she was slightly feverish; the tongue was furred, and the bowels were costive.

I considered this case as one wherein the remittance of menstruation was dependent on subacute inflammation of the ovaries, and I ordered six leeches over each ovarian region; poultices to be kept to the same regions at night; and a flannel sprinkled with camphorated liniment to be applied over the abdomen during the day. Aloetic purgatives and a sedative mixture were also prescribed. The pain subsided; the patient felt well; but menstruation returned at the morbid period of three weeks and was still painful, and left behind it a certain amount of abdominal pain. After giving a brisk purgative, I applied belladonna plasters to the ovarian regions, and gave pills similar to those taken by Miss M. A. L. The patient now says she feels well, and as menstruation has resumed its physiological type, I believe her to be cured.—*Lancet*, *Feb.* 8, 1851, *p.* 148.

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## 124.—INTRA-UTERINE POLYPUS, OF A LARGE SIZE, SUCCESSFULLY OPERATED UPON.

By Dr. W. F. Montgomery, A.M.

[On the 27th of March, Dr. Montgomery was urgently requested to see a lady at Black-rock. He found her to be about forty years of age, unmarried, and in violent agony, her sufferings recurring periodically, and resembling labour pain.]

On examination, which she consented to with great reluctance, I found the pains were produced by regular and strong contractile efforts of the uterus, the mouth of which was open to the size of a shilling, with very firm margins, and becoming very tense during each pain. Immediately within it I could distinctly feel a round tumour, which was pressed strongly into the circle of the os by every pain; in fact there was within the cavity of the uterus a polypus of considerable size, which the organ was endeavouring to expel, by efforts like those of ordinary labour. There was a tumour in the abdomen inclining towards the right side, and reaching nearly as high as the umbilicus.

She was suffering so severely, and was so exhausted by the pain, that I thought it necessary to give her a cordial and an opiate from which she derived immediate relief: the uterine efforts ceased, the polypus receded, and the os uteri gradually closed after a few days.

She was then given tonics, under which her health improved surprisingly, and no further change of importance occurred until

May 27th, when after taking a walk, severe pain again came on, with hemorrhage, and lasted three days; in consequence of which I saw her again on

May 30th, when I found the os uteri, which had been very rigid and unyielding two months before, much more open, thinner, and so relaxed as to allow me to pass my finger freely into the uterus and round the tumour, which appeared to me to have a broad and very firm attachment.

June 15th, she is looking wonderfully better, but had a sharp attack of pain and hemorrhage on the 10th, which lasted several hours.

[It was evidently highly desirable that the tumor should be removed, if practicable, immediately. But the only means to effect this seemed so hazardous that it was deemed most advisable to defer any operation for the present. On the 15th July she had a severe attack of pain of an expulsive kind, with great flooding; and on the 24th, the large end of the polypus had fairly cleared the os uteri.]

I next saw her on August the 2d, and on the 9th I passed a ligature round the neck of the polypus, fully three inches within the os uteri by means of Niessen's double canula, and more than six inches of ligature were taken up in encircling the attachment of the tumour. On the 11th symptoms of putrefaction were perceptible, and continued to increase. On the 14th the ligature appeared to be drawn home, and on twisting the canula it broke, but the polypus would not come away, though the amount of attachment remaining undivided could not have been more than a quarter of an inch in thickness.

The discharge now became horribly offensive, the pulse very quick, and the stomach irritable, so that I began to be very anxious about the result, and to fear that it would be unfortunate; yet the patient never lost courage, but maintained the most complete composure and unshaken fortitude throughout; took food freely, and slept well, never for one moment doubting, as she afterwards assured me, that she would ultimately recover, as I had promised her. And thus passed over the 15th, 16th, and 17th; each day I tried to draw the polypus down, but it seemed to be firmly grasped by the uterus, and was quite immoveable, so that no force of traction that I could safely exert was sufficient to bring it away until the 18th, that is, the ninth day from the application of the ligature, when, greatly to my satisfaction, I succeeded in extracting it; from which moment the lady never had an unpleasant symptom.

The tumor, when it came away, was greatly decomposed, softened, and consequently reduced in size, portions of it having also been torn and cut away in the attempts to get it down; but still it was of considerable bulk, measuring about five inches in length and three in breadth.

As soon as the polypus was removed I found that the tumour in the abdomen became suddenly greatly reduced in size, and in a few days was no longer to be felt.

The lady's recovery was rapid and uninterrupted; she was in the drawing-room in four days, and left town on the 28th, ten days after the extraction of the polypus: and since her return to the country, I have been informed by her brother that she is in the enjoyment of perfect health.—*Dublin Quarterly Journal of Med. Science, Feb.* 1851, *p.* 52.

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## 125.—AN ANALYSIS OF 108 CASES OF OVARIOTOMY WHICH HAVE OCCURRED IN GREAT BRITAIN.

By Dr. Robert Lee, F.R.S., F.R.C.P.

The author commences with the history of a case of ovarian dropsy, successfully removed by a surgical operation, and reported in the 'Edinburgh Medical and Surgical Journal' for 1822, by Dr. Nathan Smith, Professor of Physic and Surgery in Yale College, Connecticut. He then gives an account of an operation performed by Mr. John Lizars of Edinburgh, in 1823, when *no* ovarian disease was found after the abdomen had been opened; of three other operations, by the same surgeon, when the diagnosis was more accurate, in 1825 and 1826; and of two operations, by Dr. Granville, in 1826 and 1827. He then refers to an operation performed, in 1833, by Mr. Jeaffreson; and to three operations, by Mr. King, in 1834 and 1836. During the last twenty-seven years the operation has been attempted or performed more than 130 times in Great Britain. Of 108 cases, of which authentic reports have been

received, in thirty-seven cases either no ovarian cyst or tumour to remove existed, or there were present ovarian cysts and tumours, the removal of which was found to be impracticable, and the operation was abandoned. Of these thirty-seven cases, fourteen were fatal. The analysis given of 108 cases of ovariotomy shows that in thirty-seven, or about one-third of the whole number, it was impossible to determine *previously* whether ovarian disease actually existed, or, when it did exist, whether its removal was practicable. Of the seventy-one cases in which ovarian cysts and tumours were removed, twenty-four proved fatal, in fourteen of which the operation could not be completed. In the tabular analysis of the 108 cases appended to the paper, it appears that forty-five cases are reported by Dr. Clay, and eleven by Mr. Lane; and to both of these gentlemen the author expresses his thanks for the manner in which they have communicated to him the entire results of their experience of the operation.

[On the discussion of this subject at the Royal Medical and Chirurgical Society, Mr. Cæsar Hawkins remarked upon this operation.]

I must confess, that for the last three or four years, I have not altogether felt the same confidence in the propriety of the operation, and have seen the great necessity of the fullest information regarding it. It is well known that the operation has been very frequently attempted, and it is generally believed that a considerable proportion of the operations have been fatal, or have been impossible of completion, owing to the patient having no information [illegible] nor could I overlook the fact that [illegible] attempted by two surgeons attached to hospitals in London, that [illegible] these gentlemen has performed it twice; and that of these two cases [illegible] in which the patient was fortunate enough to recover from the operation, it was that in which I myself operated.

[On the same occasion Mr. Lawson also said:]

From the [illegible] to the [illegible] by Dr. Lee, for which he [illegible] more especially [illegible] appears that in thirty- [illegible] by him, it was [illegible] was no disease [illegible] we cannot help [illegible] startling [illegible] fect [illegible] and the [illegible] operations [illegible] of the [illegible] same [illegible] cases [illegible] has [illegible] that if a [illegible] in which [illegible] a [illegible] pedicle [illegible] cases [illegible] us [illegible] nis [illegible] point, with [illegible] cle [illegible] may pe [illegible] of which [illegible] remember [illegible] cases. It [illegible] heard [illegible] by the [illegible] who have [illegible] duction, and that [illegible] account of those to whom the operation [illegible] fatal, whether [illegible] removal of the ovary or not. The

result thus obtained must be compared with the probable duration of life in those patients who receive such relief as can be afforded by the other resources of art. Many years ago I saw a female from the North of England who had undergone ovariotomy, as it was reported, successfully, not very long before the time of my seeing her, the operator being Mr. Lizars. It was performed when what was then called the major incision was in vogue—that is, a cut through the parietes from the ensiform cartilage to the pubes, such as we make to expose the abdomen for examination after death. There was a sound cicatrix on the person of this female, indicating that an incision of that description had been made. The pelvic region was occupied by a large solid mass of disease. The comparison I have now suggested must be made between two sets of cases similar in their nature. Ovariotomy is not performed indiscriminately, but in selected instances. The cases chosen for operation are exactly those in which it is the least necessary, the danger to life being remote, and the patients sometimes living for years with only an occasional interruption of health and comfort. Mr. Hawkins has pointed out the important distinction between the simple serous cysts developed in the broad ligament, with their contents of watery consistence, and the more serious disease of the ovary itself, with its multiplied cysts, and their thick, variously coloured secretions. Two instances of the former kind were under my observation for many years, and I believe that both individuals are still living, although it is long since I have seen them. Elizabeth L——, a rather tall and well-made woman, who had always enjoyed good health, found a swelling in the lower part of the abdomen soon after the birth of her last child in 1819. It gradually increased for about three years, hardly troubling her except by the bulk, which however had become so considerable in 1823, that relief was absolutely necessary, and I drew off in St. Bartholomew's Hospital a pailful and a half of fluid, of watery consistence and slight whitish opacity. She soon recovered her health and strength, feeling as capable of exertion as at any period of her life, and for nearly two years she thought herself perfectly recovered. She increased in size at the end of this time, and was tapped again with the same complete relief as before.

From this time to 1829 she was tapped three times, and did not swell again after the last date. I saw her in October 1831, in perfect health, and without any abdominal enlargement. She had sometimes experienced an uneasy sense of fulness, which was relieved by purgatives. In the preceding winter she had suffered three or four attacks of spasmodic breathing. Since their cessation she had been quite well, and equal to all the exertions which her situation in life required. She had drunk nothing but water. I saw her again in June, 1842. She had lived for the preceding two years at Charlton, in Kent, enjoying excellent health, and free from every trace of her former disease. I tapped a lady for ovarian dropsy, and let out a few pints of clear fluid. She regained her former size, and considered herself quite free from the disease. In four or five years she increased in bulk, and the operation was repeated, a smaller quantity of similar fluid being drawn off.

I saw her again in 1842, sixteen or seventeen years after the first operation. She had enjoyed uninterrupted health since the last tapping, and nothing abnormal could be detected in the abdomen on the most careful examination. A statement more remarkable even than those in Dr. Lee's communication has come out in the course of this evening's discussion, having been accidentally elicited, rather than mentioned intentionally. A gentleman, who spoke from the middle of the room, has informed us that he had performed ovariotomy twelve times, and had intended to communicate the particulars to Dr. Lee. This list of operations, however, is of little importance, in comparison with the other matter, mentioned subsequently—viz., that in between forty and fifty cases, as I understood him, he had made an opening into the abdomen, in order to ascertain, in cases of supposed ovarian disease, whether the state of things was fit for operation; and having found that it was not, he closed the opening again. He added that not one of these persons had suffered from the proceeding. If we had not heard this report from the operator himself, we might have been excused for feeling some hesitation in giving it credit. To

determine whether a diseased ovary, or other abdominal tumour, admits of excision, it must be necessary to examine the situation and connexions of the part with the hand, which would require a somewhat large cut through the abdominal parietes. To find that this could be done with impunity in between forty and fifty instances is what we should have little expected. As similar good luck could hardly be expected to attend other patients, I would caution the younger part of the company against imitating the boldness of this operator. The naked statement heard to-night does not enable us to appreciate the affair satisfactorily; we must wait for that promised publication of full details which is necessary to substantiate so novel a report. In the meantime, the simple statement, coupled with thirty seven cases of Dr. Lee, affords evidence of difficulties in diagnosis that must be perplexing to the ovariotomist. A gentleman on the left has brought before us another proposal; that of making an incision in the abdominal parietes, and then cutting into the ovarian cyst, for the purpose of establishing a communication with the exterior, to serve as an excretory duct, or, as I think I think he called it, an oviduct. He is probably unaware that diseased ovaries have been dealt with long ago, in various ways more or less similar to this. The result has been, I believe, invariably fatal. Ovariotomy, with all its dangers, has the merit of completely removing the disease. This plan, more dangerous than ovariotomy, would leave the disease behind, lighting up inflammation in the great mass covered by peritonæum, and in immediate contact with the abdominal viscera. Many years ago, I saw attempts of this kind in more than one or two instances; they were all fatal. The discussion of this evening, excited by the important communication of Dr. Lee, will at least serve the useful purpose of admonishing us to pause in the attempts at treating diseased ovaries by surgical operation; and, after seriously considering the matters brought to light by that communication, the forty or fifty cases from another quarter, and the proposed oviduct scheme, to ask ourselves the question whether such proceedings can be encouraged, and continued without danger to the character of the profession.—*Lancet, Nov.* 23, 1850, *p.* 584.

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## 126.—TREATMENT OF OVARIAN DROPSY BY THE PRODUCTION OF AN ARTIFICIAL OVIDUCT.

[This mode of treating ovarion dropsy introduced by Mr. Brown is a modification of that of Mr. Bainbridge, to whom he would accord the merits of having first seized upon the guiding principle—that of setting up adhesions between the sac and the abdominal parietes, and leaving the sac to exhaust and destroy itself, by its discharge through an artificial opening.]

The operation consists in making an oblique lateral incision in the middle third of the oblique line, extending from the umbilicus to the anterior superior iliac spine, reaching at first to the peritonæum, then puncturing and emptying the cyst by a trocar and canula, and the peritonæum being reflected, to subsequently stitch the cyst to the aponeurotic tendon of the external oblique muscle; and this being done, to divide the cyst between the line of the sutures; and, finally, in keeping up the communication between the interior of the cyst and the exterior, allowing the free and constant escape of all secretions produced within it. This operation of Mr. Brown differs from that practised by Mr. Bainbridge, in that the fistulous opening is formed in the side, and not in the middle line, whereby the discharge from the wound is facilitated, and the greatest comfort to the patient ensured. In illustration of the practicability and advantages of the operation, Mr. Brown proceeded to narrate the history of three cases in which he had carried it into practice.

Mr. Brown drew the following conclusions—1. That some cases are curable by pressure—namely, those in which the cyst is unilocular, without adhesions, its contents clear and not albuminous, and where the condition of the patient affords time for the requisite perseverance, no counter-indications existing. 2. That some multilocular cases, and such as present adhesions of the cyst, are to be materially relieved and retarded by pressure. 3. That in cases where pressure has failed, or is contra-indicated—whether the disease be unilocular or

multilocular—but without adhesions, extirpation affords a means of cure; but in all such cases, before this severe operation is resorted to, time and the condition of the patient not opposing, pressure should be first tried. 4. That where the extent and character of the adhesions forbid extirpation, and where pressure is contra-indicated, or has been practised and failed—in such cases the lateral operation above described presents a means of cure having the greatest promise of success. 5. That this lateral operation may be performed with facility, and is attended with little danger; no case of peritonitis having occurred to the author in the many instances in which he has had occasion to cut down upon and divide the peritoneum in the operation in question, and also in others.

In the discussion which followed the reading of this paper, the general feeling of the members was against the proposition, Mr. HIRD expressed his belief that patients suffering from ovarian dropsy had, generally speaking, a better chance of prolonged life by constitutional treatment, quiet, and the avoidance of local interference, than by resorting to any operative procedure. —*Med. Gazette, Nov.* 29, 1850, *p.* 959.

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## 127.—OVARIAN TUMOURS.

By DR. EDWARD JOHN TILT.

[Dr. Tilt first seeks to distinguish ovarian tumours from each other, and from the tumours of other organs. The chronic kind, contrary to the acute, are remarkable for their insidious beginnings, and the length of time generally required for their growth. These kinds also are generally unattended by fever, whilst acute ovaritis is frequently attended by a degree of fever proportionate to the amount of suppuration occurring in its tissue or in its vicinity. Chronic ovarian cysts may be classed as follows: 1. Piliferous; 2. Hydatid; 3. Fibro-serous; 4. Heteramorphous tumours; and 5. Cancerous encysted tumours.]

One of the first, certainly the most important organ with which ovarian growths interfere, is the womb, and we shall have to examine the action of these tumours—

I. On the unimpregnated womb.

II. On the impregnated womb.

1. Action of ovarian tumours on the impregnated womb.

The ovarian tumour at first retains the usual position occupied by the ovary, but when it has attained the size of a hen's egg, if free from inflammatory adhesions, it has a tendency to glide down into the rectovaginal pouch. As the tumour increases in that recess it pushes before it the posterior wall of the vagina, often obstructing this passage so as to render difficult the introduction of the finger, and still more so the intromission of the male organ. When thus situated the tumour presses on the neck of the bladder by its anterior surface, and on the rectum by its inferior, while it often draws down the fundus uteri with it, so as to produce more or less complete retroversion, which has been noticed by Siebold, Boivin, Seymour, and Burns. It may even raise it above the pubes, and by its continued pressuse cause it to become atrophied. Sometimes, however, the tumour insinuates itself into the vesico-vaginal pouch, and in time gives rise to an anteversion of the womb. It will be easily understood what peculiarities of its mode of attachment may cause the lateral flexions of the womb which have been sometimes noticed.

But the tumour may be so placed as to press upon the fundus uteri, forcing it down as it grows, and thus determining prolapsus or even procidentia. This is of rare occurrence, but such cases have been noticed by Meissner, Dugast; and in Dr. Mogerkouski's successful case of ovariotomy it is said that the uterus was forced out of the vagina by the cyst. The patient had two children after the operation.

It is impossible for these displacements to occur without considerably modifying the position and dimensions of the vagina; and we find that it is lengthened, and often drawn to one side, when there is but one tumour, as it has been

observed by Montaulieu *fils*, Laporte 'Tom ii. Mémoire de l'Acad. de Chirur.', Voisin (loc. cit.), and myself.

In a case cited by Duges, the tumour so pressed upon the vagina as to determine the inflammatory adhesion of its internal surface, and consequent obliteration (?) of course, this latter accident, and even the uterine displacements we have enumerated, interfere sufficiently with the functions of generation so as in many cases to produce sterility.

When, however, the tumour has so increased as to be ill at ease in the restricted proportions of the pelvis, it imitates the womb, which after the first few months of pregnancy rises above the brim of the pelvis, draws up the womb and therefore the vagina, to which it gives a slanting direction, which is recognizable by the oblique and elevated position of the os tincæ. In such cases the vagina often takes upon itself an infundibuliform appearance. Burns thinks that the vagina is more particularly drawn up and lengthened when both ovaries are affected. Thus it has occurred that the uterus is drawn completely out of the pelvis by an ovarian tumour, the neck of the womb forming a narrow canal of from four to six inches long. In the case observed by Cleghorn the womb was drawn up to the navel.

Dupuytren has several times met with the womb drawn up, so as to run the risk of being pierced by the trocar during the operation for paracentesis performed to remove the contents of an ovarian cyst; an accident, Voisin relates, as having really occurred to a surgeon of his acquaintance.

One of the most singular cases of lengthening of the womb is quoted by Morgagni (Epis. 45, 12) from Vater, who relates the fact of the neck of the womb being stretched in contrary directions by an enormous swelling of the ovary, and by *prolapsus vaginæ* (?) and this leads us to remark, that the ovarian tumour often rises above the brim of the pelvis without leaving the pelvic cavity, to the walls of which it has become strongly adherent. The solid tumours are particularly liable to become permanently established there, displacing the pelvic viscera, firmly fixing the womb, and even incorporating it in their own substance,

If both ovaries are implicated, inasmuch as they are generally affected successively, and one is less enlarged than the other, the smaller one remains in the pelvis, and its retention is proportionate to the obstacles offered to its ascent by its fellow. It is wedged in between the uterus and rectum, even if there are no adhesions. If we find the above mentioned irregularity in the uterus and in the vagina, and at the same time discover an immoveable tumour in the pelvis, which weighs upon the posterior walls of the vagina, and pushes it together with the uterus forwards, it may be assumed, if there are no countervailing symptoms, that both ovaries are diseased.

As the tumours increase, and their contents often have an outward tendency, inflammation may arise between the cyst and some part of the parturient canal. The tumour most frequently voids its contents through the vagina; and we subjoin such instances as the reader will not find in the literature of our own country.

Bluff 'Jour. de l'Experience' relates the case of a woman who by degrees ceased to menstruate, while in the mean time the left ovary, by gradually increasing, had at last attained the size of a man's head, and pressed strongly on the vagina, the womb and right ovary remained unimpaired. Hectic fever came on, in consequence of which an opening was formed on the left side of the vagina, which had become very painful. The contents of the cyst passed through this opening, and the tumour disappeared. The opening being closed, menstruation became regular, and the patient's health was restored.

Helman 'Siebold's Jour. vol. ii.' relates the occurrence of this termination after an effort to lift a heavy weight; probably inflammation had previously softened the tissues, which burst assunder from intense muscular exertion. Wertenkampff also saw the left ovary attain the size of a man's head, and empty itself through the vagina; the patient was cured, and menstruation returned. Munro observed a similar substance; but the dropsical effusion returned, and terminated by carrying off the patient. Mme. Boivin saw two

similar cases; the one was cured, and in the other the disease returned. Hey, 'Pussian Med. Jour,' was on the point of tapping a woman, when water gushed from the vagina, and flowed four days; the patient recovered. Burdach treated a woman who, on lifting a heavy weight, burst an ovarian tumour, the fluid of which was evacuated by the vagina. A year and a half after, the dropsy had not returned 'Hufeland's Journ. of Prac. Med., June, 1833.' A similar case is published by Forcke 'Hanover Annals, 1838.' In some cases the liquid seems to have sought for itself a more complicated, although a natural passage, by passing through the fallopian tubes, the uterus, and the vagina. Blasius 'Commentatio de Hydrope ovarium profunte, Halle, 1834' has collected several cases wherein the contents of the cyst were emptied by the fallopian tubes into the womb.

Schmucher also says, that in one case, after the sixteenth tapping, the ovary became suddenly extremely painful in one night, and was followed by the discharge of a large quantity of very offensive ichorous matter through the womb, which discharge continued for some days, and then ceased.

Frank 'De Cur. Ret.' gives a case where serous matter was discharged until death, by the uterus and vagina, to the extent of one pint per day. The patient died of consumption, and thirty-one pints of fluid were found in the left fallopian tube. Sir Astley Cooper mentions, also, a case of this description.

And, lastly, Dr. David D. Davis used to narrate a case in his lectures where the discharge of the fluid was brought on through this channel in a countrywoman by the jolting of her horse as she rode to market.—*Medical Gazette, Dec.* 6, 1850, *p.* 961.

[With regard to the effect of ovarian tumours on the impregnated womb, we may say, that it is rare that they determine to abortion when there is room for the development of the tumour and the womb. They more frequently bring on premature labour, but generally speaking the morbid physiological tumours progress side by side until the full period of pregnancy.]

When, from the length of its pedicle, or from the mode of its attachment, the tumour is situated by the side or above the enlarged womb, it neither impedes labour nor aggravates its phenomena.

Often a small or moderately-sized tumour, or a lobe of an irregular shape, prolapses into the recto-vaginal space before parturition has come on, or descends into this space towards the end of gestation, when nature is preparing for the delivery of the woman by a general relaxation of the soft parts of the pelvic cavity. Such cases have been described by Merriman, Denman, Ingleby, Madame Lachapelle, and others; and they often seriously complicate labour, unless, as we shall see when we come to the treatment of these affections, there is a possibility of pushing up the tumour above the womb, in imitation of what in similar cases has often been effected by the sole powers of nature.

The womb, when about to accomplish its important function, may displace a tumour which impedes the performance of that function. When it cannot do so, it frequently bursts the tumour, so as to evacuate its contents through the vagina, and to allow parturition to proceed in safety; and, when we consider what an enormous amount of pressure nature employs to produce delivery, we need not wonder that it often crushes in this manner an ovarian cyst. This occurred in a case related by Dr. Ashwell. The labour was obstructed by a tumour which burst into the vagina, and discharged a dark offensive fluid. Delivery was then shortly effected, but death took place on the second day. On examination post mortem, a large cyst was discovered growing from the left ovary, the vagina being ulcerated and gangrenous at the part where it communicated with the cyst (Guy's Hosp. Rep. No. 2). A case is also reported by Dr. Langley of an ovarian tumour which burst during labour, and was attended by the escape of several gallons of serious fluid (No. CXL. vol. vi. of Lond. Med. and Surg. Journ., Oct. 4, 1834, p. 319.)

Mr. Brown has lately published a case which illustrates this termination of ovarian dropsy. It is as follows:—"I was called to see a lady pregnant with her second child. I found her ill and weak, complaining of the enormous size of her abdomen, and satisfied in her own mind that she should

have twins. At the proper time labour came on, and the child was born without difficulty; but on placing my hand externally to grasp the uterus, I found I could not feel it, for the pelvic cavity was filled by a soft, elastic tumour, and the uterus had ascended out of the pelvic cavity, and was above this tumour. In introducing my hand into the vagina, and endeavoring to reach the uterus to remove the placenta, and pressing my other hand over the uterus, I had the pleasure to feel the tumour, which I felt was an ovarian cyst, suddenly rupture, and discharge its clear amber colored fluid down the side of my arm. On a subsequent confinement not a vestige of this tumour could be felt.

On ovarian cyst may produce scarcely any impediment to delivery, and yet the portion of the sac which has entered the septum may inflame, discharge its contents and the patient recover. Thus Dr. Davis saw a tumour in the left iliac region, complicating but not impeding labour, produce dangerous symptoms, and burst in the vagina on the 27th day after delivery. The tumour disappeared and the patient recovered. Whether the disease was ovarian or uterine could not be positively determined, but it was most likely the first.

The bursting of the cyst, and effusion of its contents into the peritoneal cavity, is a third termination of ovarian cysts, and we shall soon show that the accident is attended by much less danger than has been hitherto supposed, provided the contents be of a fluid and albuminous nature. Dr. Ingleby had noticed this termination during pregnancy. Mr. Headland (Lancet, June 22, 1844) relates a case, and Dr. Peddie (Medical Times, Feb. 22, 1844) mentions that a woman, in whom he clearly detected an ovarian tumour about the size of a child's head, became pregnant, and after delivery no trace of it could be found. It is therefore fair to conclude that it burst during delivery; and, as it did not re-appear, that it was effectually cured.

There is a fourth termination of an ovarian tumour—the expulsion of the whole tumour through the vagina. There is, as far as we are aware, but one recorded instance of this natural operation of extirpation of the ovary, and it has been published lately by Mr. Rankin, of Carlisle, in the 'Edinburgh Monthly Journal' (July, 1850.)

Mrs. G——, twenty-seven years of age, was the mother of five children. The first two labours were natural; but after a difficult labour, from an unascertained cause, she again became pregnant. A large tumour, occupying the cavity of the pelvis, interrupted the efforts of nature at the next birth, and delivery with the crotchet was with difficulty accomplished. The patient again became pregnant: and as the tumour was now of greater size, delivery by the natural passage was considered impossible. Delivery was effected, however, by turning the child and forcing the tumour from its place in the pelvis upwards. Thirty-eight days subsequently a tumour was expelled from the body. It was a partially putrid mass, ten inches long, five broad, and weighing fourteen ounces, consisting of a dense, fibrous substance, fringed here and there with small cells, emptied of their contents. I examined the vagina (says Mr. Rankin,) and detected an opening, small compared with the size of the diseased parts, which must have passed through it; yet, after contraction, it freely admitted two fingers. It was irregular in form; the parts around were indurated; and, with the aid of the speculum, they were found to be inflamed. The bulk from the tumour above the pelvis had entirely disappeared; but on pressure upon its former seat, and counter-pressure from within the vagina, there was still considerable fulness, which might arise from induration of the parts concerned in the recent separation and rejection of the morbid structure. If we listen to the testimony of Dr. Selkirk, of Carlisle, in whose practice the case occurred, and who followed it throughout, we must undoubtedly admit that the tumour was fibrous and ovarian:—

"I am convinced (says Dr. Selkirk—Lancet, Oct., 1850) for the following reasons—be the tumour ovarian or not—it was not intra-uterine. The tumour occupied, during the intervals of impregnation, the right iliac fossa, as was evident to the eye, and palpable to the touch; and, on internal examinations, it was always pointed in the same direction. I remember well that, during

the first stage of labour, in her confinement in 1846, which was protracted from what I at that time deemed an unusual thickening of the posterior portion of the cervix uteri, or the hand partially introduced in order to arrive at a more satisfactory knowledge of the presenting part, the fingers passed beyond the indurated point, and into the uterus. Again, at her labour in 1848, in which the perforator and crotchet became necessary, being obliged to remove the placenta by the hand, the uterus, gliding down by the margin of the tumour, contracted ball-like, quite as low as usual, and to the left iliac fossa. Further, in her labour in February last, I again removed the placenta, the uterus contracting distinctly downwards by the margin of the tumour; and manipulation by the fingers externally detected the womb isolated from, and to the left side of the morbid growth. Now is it at all likely, admitting the tumour to be uterine, that the organ would contract so regularly, satisfactorily, and to its ordinary dimensions, around such a large diseased mass? I opine not."

We have been careful in establishing the preceding facts, because the case is one of interest, and because it proves that we cannot as yet accord to the microscopical investigator, however, eminent he may be, the right of deciding all pathological questions. The fibrous tumour was examined by Professor Goodsir, who said that it could be nothing else than a uterine fibrous tumour; and influenced no doubt, by so excellent an anatomist, a distinguished midwifery professor also considered the tumour to be uterine.

We have also shown that this cannot be admitted. Dr. Selkirk recognised its independent extra-uterine position at the labor previous to the one after which it was expelled. It was evidently torn from its pedicle by Mr. Rankin during the operation of turning; for we read (Edinburgh Monthly Journal, July, 1850, p. 15:)—"Very considerable force was necessary to bring the child into the pelvis. During this operation the tumour was gradually *forced up* from the cavity of the pelvis into that of the abdomen, and a sensation of *tearing was communicated to my hand, and rendered audible*, which led me to conclude that some fearful disaster was impending. This was soon found to be referrible to the parts of the mother, for the child was born uninjured." The rent through which the tumour passed was seen by means of the speculum; and we may well admire the wonderful agency by which such a tumour was with impunity expelled from the peritoneal cavity of a patient thus almost miraculously cured of a usually fatal complaint; while the well-being of both mother and child shows that Mr. Rankin's conduct should be imitated in a similar case.

It appears that not only the vagina, but the uterus itself, has been perforatep through the instrumentality of an ovarian tumour, which, by producing an obliquity of the uterus, effectually pushed the head of the child out of the axis of labour, bringing it to bear on the edge of the pelvis with sufficient force to cut through the walls of the uterus. Tumours of the fallopian tubes are less frequent than those of the ovary, so do they less frequently cause serious obstruction to parturition. We believe there is but one case on record when this occurred; it is given by Chambon de Boulage 'Anciens Journal de Med.-Chir. et Phar.' The patient died and the obstruction was found to have been caused by an irregularly-shaped, hard, and in part osseous, tumour. It is not surprising that this complication should be a frequent cause of mortality.

*Effects of Ovarian Tumours on the Bladder.*—The bladder soon feels the pressure of an ovarian tumour, and it often affords the first indication of its slow beginnings. It gives rise to a frequent want of passing water, which is the result of a nervous irritation, most distressing to the patient, long before the tumour has acquired a sufficient size to diminish the capacity of the bladder. At a later period of its growth, if the tumour cannot rise from the pelvic cavity, it may press on the urethra, and so impede the passage of the urine that the patient is obliged to bear forcibly backward in order to pass water. When the whole tumour is pelvic, or when a considerable portion of it is forced into the pelvis, it presses so forcibly on the urethra as to render impossible the flow of urine, and require catheterism. It has even necessitated the puncture

of the cyst by the vagina, as in a case which occurred to Mr. Ogden.—Lond. Med. Gaz. Jan., 1840.'

When, however, the tumour completely, or even partially, leaves the pelvic cavity, all signs of vesical disturbance cease, and although the bladder may be displaced (as in a case related by Portal), or drawn up, pushed on one side, and diminished in size, still it, generally speaking, adapts itself with wonderful facility to the emergency.—*Med. Gazette, Dec.* 20, 1850, *p.* 1059.

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## 128.—ERGOT OF RYE.

By Dr. Meigs, of Philadelphia.

Dr. Meigs, of Philadelphia, in his valuable work on midwifery, in speaking of ergot, says:—"A labour is effected by the contractions of the muscular fibres of the womb, aided by that of the abdominal muscles. If all the powers employed in a labour could be accumulated in a single pain, lasting as long as all the natural pains do, no woman probably could escape with life from so great an agony, except that small number who are met with, and whose organs, hapily for them, make no resistance, but open spontaneously like a door, to let the fœtus pass out. By a beneficent law of the economy, the pains of labour are short, not lasting more than thirty or forty seconds in general, and returning once in three or six minutes. Under such pains or contractions, however powerful, the fœtus is safe; for as soon as the contraction is over it lies in the womb free from pressue, and the placenta, which during the contraction had been violently compressed betwixt the womb on which it lies and the child within the cavity,—that placenta, I say, recovers its circulation, and continues during the absence of the pain to perform all the bronchial offices which belong to it. But," he continues, "if an ergotic pain is produced to last thirty minutes, in a case where the placenta is on the fundus uteri, and to be jammed for thirty minutes against the child's breech without an instant of relaxation, who can doubt that its circulation is either wholly or nearly abolished; and that when the child emerges at last from the mother's womb it will emerge quite dead or in a profound asphyxia from the long suppression of its placental circulation? Multitudes of children are born dead from this very cause, by the imprudent exhibition of a medicine which as certainly excites a spasm of the womb as nux vomica does that of the other muscles of the body. For my own part," he adds, "I could say that I scarcely give ergot as an expulsive agent; I chiefly employ it at the moment or just before the birth of the child, in order to secure, if possible, a permanent and good contraction of the womb after labour in women who are known in their preceding labours to have been subject to alarming hemorrhage."—*Dub. Quarterly Journal of Med. Science, Feb.*, 1851, *p.* 40.

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## 129.—TWIN BIRTH, IN WHICH THE SECOND CHILD WAS BORN EIGHT DAYS AFTER THE FIRST.

Dr. Behr relates the case of a woman, forty years of age, who gave birth to child at half-past twelve in the day of the 29th of April, and to a second at six o'clock in the morning of the 3rd of May, 1849. Both the children were females. The first child lived an hour; the second, which had been felt to move in the uterus a short time before delivery, was born dead. The pregnancy was at or about the sixth month. The second fœtus only was seen by Dr. Behr; it was about a foot long, and weighed more than a pound. The first child was born with a natural presentation; the second was born footling. The double placenta weighed about three-quarters of a pound. As the second fœtus was being expelled the mother was seized with such severe rigors that it was necessary to hold her on the bed. Immediately after this, profuse uterine hemorrhage occurred, which compelled the midwife to call in Dr. Behr. The patient had been in want of sufficient food during the week, and had been imprudently permitted to leave her bed to follow her household duties. Peritonitis followed, and the woman died on the 21st of May.—*Casper's Wochenschrift.—Med. Gazette, Feb.* 7, 1851, *p.* 227.

## 130.—CASE OF LACTATIOX IN A MALE.

By. Dr. C. W. Horner, of Philadelphia.

The following is a singular case of lactation in an adult male. It occurred in the person of an athletic American, named Charles Collins, aged twenty-two years, a blacksmith, working at his trade in New York. About the 10th of February last, his attention was first drawn to his left breast, which appeared to be enlarging, and continued to increase in size for three weeks, when he came to Philadelphia. After being in this city for three weeks, he became quite anxious in regard to his condition; for, although he suffered very little pain, the mamma had become quite as large as that of a female nursing. He therefore, through the persuasion of an aunt, was, on the 23rd of March, induced to apply at the Clinic of the Jefferson Medical College to consult the faculty of that Institution. His case came up before Prof. Mutter, who upon examination found the mammary gland largely developed, and filled with lacteal secretion, which differed in no wise from that of a mother. He could assign no cause for this freak of nature: his health was very good, and the other breast natural. A soap plaster was prescribed, and compression ordered to be kept up, which he persisted in for full six weeks, when the gland returned to its usual size; and when I saw him this morning at Fairmont, where he now resides, it was in every respect like the other.—*Philadelphia Medical Examiner.—Med. Gazette, Jan.* 24, 1851, *p.* 176.

## 131.—THE INFLUENCE OF THE HOUR OF THE DAY ON THE BIRTH AND DEATH OF MAN.

By Dr. Casper.

The following are briefly the conclusions of Dr. Casper on the influences investigated by him:—

1. *As to Births.*—More births occur from nine o'clock in the evening to six o'clock in the morning than during other hours of the twenty-four. Labour pains commence more frequently between midnight and three o'clock in the morning than at other times. Of those births which terminated during the day, the majority were male children. Labour is longer if the pains begin in the day-time than if it commences during the night. This influence is more striking with still-born than with living children.

2. *As to Deaths.*—The maximum general mortality occurs during the earlier hours of the day, the minimum in the evening. Of special causes of death, the relative mortality with reference to the time of the day presents many variations. Inflammatory diseases present their maximum in the after-part of the day; fevers and exanthemata, in the earlier hours of the night; hemorrhages in the fore part of the day and in the afternoon; and the neuroses generally in the hours after midnight.—*Medical Gazette, April* 18, 1851, *p.* 704.

## 132.—HISTORY OF A SUCCESSFUL CASE OF OVARIOTOMY.

By W. E. Duffin, Esq.

## WITH A DESCRIPTION OF THE MORBID ANATOMY OF THE SAC.

By Dr. R. Lee, F.R.S.

A woman, 38 years of age, having her abdomen enlarged to the size of the eighth month of pregnancy, this size having been attained in seven or eight months, her general health appearing to be good, applied to the author for relief by operation. The rapid growth of the tumour, which appeared to be connected with the left ovarium, had been accompanied by neuralgic pains in the right thigh, in consequence of pressure on the sciatic nerve of that side. The tumour was very moveable, indicating the absence of adhesions. The patient was very urgent in her desire for the operation, and very confident that it would be successful, and it was consequently performed, on the 27th of August last, by the author, assisted by Messrs. Fergusson, Ure, and Henry Smith, chloroform having been previously administered by Dr. Snow. The incision, at first of only sufficient size to admit the fore-finger for

exploration, afterwards enlarged to three inches, was made in the linea alba, midway between the umbilicus and the pubes. The absence of adhesions having been ascertained, the sac was punctured by a trocar, and 130 ounces of a viscid, ropy fluid, of a light brown colour, were let out. The collapsed cyst, containing a smaller cyst the size of an orange, was drawn through the incision, and its pedicle secured by ligatures. The tumour was then separated, and the pedicle and ligatures were prevented from receding into the cavity of the abdomen by other ligatures attaching them to the wound. The ligatures came away on the 15th day, and the wound was healed on the 22d day, the abdomen resuming its natural shape and size.

The patient was kept on a light diet, and took opium in sufficient doses for six successive nights, and the bowels were opened by enemata. On the 18th day she was able to get about a little. Her recovery has been complete, and she has been enabled to resume the occupation of dressmaker.

*Dissection of the Cyst*, by Dr. Robert Lee, F.R.S.—The walls of the cyst are composed of three distinct coats or layers. First, a peritoneal covering; secondly, a middle fibrous coat; and thirdly, a dense membranous sac, in which the fluid was contained. In the divided pedicle are seen the cut ends of three large arteries, and of one large vein, and of the Fallopian tube. The peritoneal coat is thin, and loosely attached at the root of the cyst; but beyond this it is thick, opaque, and firmly adherent to the tissue below. The middle coat is thick at the root, and contains numerous branches of arteries, and of nerves with ganglionic enlargements. It becomes thinner as it is expanded over the cyst, is of dense fibrous structure, and adheres firmly by both its surfaces. The internal membrane is firm and thick, and its inner surface is rough, irregularly puckered, and in some spots of a brown or yellowish colour. It consists of two distinct layers, like the coats of a Graafian vesicle. A smaller cyst is situated near the root of the larger, imbedded in its middle coat, projecting into its cavity, and invested by its lining membrane, which it has pushed before it. The lining membrane of this smaller cyst also consists of two distinct layers, like that of the large cyst.

A group of small multilocular cyst is contained in the middle fibrous coat of the great cyst, and between the outer surface of the smaller cyst and the peritoneum. They have the same structure, contain a similar fluid, and bear the same relation to one another, as the two cysts above described. The author remarks, that "the walls of this ovarian cyst contain all the elementary structures which enter into the composition of the human ovarium in the healthy condition—peritoneum, stroma, and Graafian vesicles, with blood-vessels and ganglionic nerves. Whether all multilocular cysts are formed in the same manner, future observation must determine."—*Med. Gaz.*, *Nov.* 22, 1850, *p.* 893.

## 133.—ENCEPHALOID DISEASE OF THE PERITONÆUM.

By Dr. Snow Beck.

[At a meeting of the Medical Society of London, Dr. Beck exhibited the uterus, ovaries, and portion of the large intestine, taken from the body of a woman who died of encephaloid disease. During life she complained of no pain, though the abdomen was distended with fluid, and covered with dilated superficial veins. She had also obstinate constipation of the bowels, and constant vomiting of stercoraceous matter. A large round smooth body was found behind the uterus, immovable in the pelvis. After death the abdomen was found to be distended with dark brown-coloured serum; the parietal and visceral peritonæum were much thickened, of a grey, somewhat translucent appearance, and dotted over with small masses of cancer, varying from the size of a pin's head to that of two peas. The edges of the intestine were deeply injected, of a dull red colour. The omentum was much wrinkled up and infiltrated with similar matter.]

The uterus was of the natural size, but united into one firm mass, with the ovaries and middle portion of the rectum. No malignant deposit was found in any of the viscera, except one nodule in the pylorus, and it was doubtful whether this were not in the subserous cellular tissue. The intestines were much twisted from their natural positions in the abdomen, and the seat of the

constriction was found to be near the termination of the small intestines, and was produced by the contraction of the mesentery drawing the intestine into an angular fold, and so obstructing the passage of the fæces. On more careful inspection, the peritonæum was found little altered; but the subserous cellular tissue was much thickened by the deposit of fibro-plastic material. The cancer was deposited in isolated small nodules, chiefly above the course of the blood vessels, and these probably, by exciting inflammation, led to the deposit of fibro-plastic matter, by the subsequent contraction of which the displacement of the intestines, and the ultimate obstruction to the fæces, was accomplished. The cancer was deposited immediately beneath the peritonæum, in masses of a round or oval form, of a grey, somewhat semi-translucent appearance at the circumference, with a light-yellow opaque centre, extremely like tubercular material. Examined by the microscope, the grey portions were seen composed chiefly of a transparent stroma, containing many granules and numerous cells. The cells were round or oval, of various sizes, yet all small, with defined outline, thickened capsule, and granular contents. Some of these contained two, three, or five nuclei, whilst others appeared not to have any. By the action of acetic acid, the capsule and contents became more transparent, and the nuclei more distinct. The light yellow central portions consisted of nuclei, identical in appearance to those already described, yet with a decided yellow tinge of colour. The stroma was less in quantity, the cells were more crowded together, and the granules in greater abundance. The left ovary was dilated into a thick sac the size of a hen's egg, containing clear light-brown fluid. The interior of the sac was lined by a loose red coagulum. The right ovary formed a mass of solid cancerous disease, in size a little smaller than the left. Covering the ovaries and body of the uterus, and uniting those to the rectum and cellular tissue in the pelvis, was a thick layer of grey thickened subserous cellular tissue, closely dotted over with small nodules of cancer. The contraction of the material had bent the uterus upon itself, anteriorly presenting the curved body of the organ to the finger introduced into the vaginia. This smooth rounded surface, coupled with the firm agglutination to the surrounding structures, gave to the feeling of an enlarged and weighty organ pressing upon the rectum. The substance of the uterus was pale, and rather firmer than usual, presenting numerous yellow points on the cut surfaces, which were principally seated near the fundus. They were found to be the diseased blood-vessels surrounded by a yellow-coloured cellular tissue, infiltrated in which were some cells identical in appearance to those already described as formed in the masses beneath the peritonæum. The neck of the uterus was in no way altered from the natural appearance—the orifice large, open-fissured, and the lips swollen. Surrounding the orifice were several small round transparent bodies, filled with transparent white-of-egg mucus, and at one side of the orifice a rounded sessile mass projected from the lips. This on being opened was seen to be a cyst filled with transparent white-of-egg mucus, which contained, at one part, many compound granular corpuscles and fat globules. There was no ulceration or excoriation present. Apart from the interest which this case presents, as one of malignant disease infiltrated beneath the peritonæum, thus giving rise to inflammation and the exudation of fibro-plastic material, by the contraction of which latter produce great displacement of the viscera was produced and permanent obstruction of the intestines, it offers an excellent demonstration of some of the errors which have been imported from abroad into the department of pathology. It is said, that the body of the uterus is not liable to inflammation, because there is no cellular tissue in the part. Here is a demonstration, not only that this tissue exists, but that it is infiltrated with cancer cells. Again, this patent state of the orifice is said to be "pathognomonic" of ulceration, yet no ulceration is here present, nor is there any excoriation. The fissures at the orifice have also been said to depend on lacerations during parturition, whilst here they are shown to depend on a swollen state of the structures of the neck, depending upon an enlargement of the glands by retention of their contents, the structures being constricted within a circumscribed compass, and hence becoming folded, and forming fissures between the folds.—*Lancet, Feb.* 1, 1851, *p.* 120.

# ADDENDA.

## 134.—STATE OF THE BLOOD AND THE BLOOD-VESSELS IN INFLAMMATION.

(From a Review of the works of Messrs. Paget, Jones, and Simon, in the British and Foreign Medico-Chirurgical Review.)

"The very difficulty of exactly defining the process of inflammation may be our guide to the most hopeful method of investigating it. When we see such gradual transitions, from the normal process of nutrition to the disease of inflammation, that we cannot draw a definition line between them, we may be sure that the main laws of physiology are the laws alike of the disease and of the healthy process; that the same forces are engaged in both; and that, though interfered with by the conditions of the disease, they are not supplanted or annulled.

"Now, such transitions from the normal processes to that of inflammation are not rare. We may trace them, for example, in the gradual passage from the active exercise of the brain, or of the retina, to its 'irritation' when overworked, and thence to its complete inflammation and impairment of structure, after long exposure to what had been a natural stimulus, or to what, in a less degree, might be so. Or, on the introduction of medicines, such as certain diuretics, into the blood, we may trace gradations from the normal increase of the functions of the kidneys, under what is regarded as no morbid stimulus, to their intensest inflammations. Or, again, in the application of an abnormal stimulus, such as that of a heat greater than the natural temperature of the body, where shall we mark the line at which inflammation begins to supervene on health? We may, indeed, say that stagnation of blood, or effusion of liquor sanguinis, shall be the condition *sine qua non* of inflammation; we may call whatever falls short of these, 'active congestion,' 'irritation,' or by any other name; but in practice, such distinctions are often impossible, and sometimes untrue; and in study, the terms are convenient for the sake of brevity rather than of clearness."

[The conditions necessary to healthy nutrition are as follow:—1st. A regular and not far distant supply of blood. 2nd. A right state and composition of that blood. 3rd. A certain influence of the nervous force. 4th. A normal state of the parts in which nutrition is to be effected. All these are usually altered in inflammation. I. Of the supply of blood. Now, what changes take place in the condition of the walls of the blood-vessels in a part where the inflammatory state has developed itself?]

The effects of various kinds of artificial stimuli upon the calibre of the blood vessels, has been the subject of examination by a great number of experimentalists; and there is a very general accordance in their results. Mr. Paget has made much use of slight mechanical stimuli.

"If, as one is watching the movement of blood in a companion artery and vein, the point of a fine needle be drawn across them three or four times, without apparently injuring them or the membrane over them, they will both presently gradually contract and close. Then, after holding themselves in the contracted state for a few minutes, they will begin again to open, and, gradually dilating, will acquire a larger size than they had before the stimulus was applied.

"Simple as this observation is, it involves some cardinal facts in our pathology. It illustrates, first, the contractile power of both arteries and veins; and, by the manner of their contraction, which follows at some interval after the application of the stimulus, and is slowly accomplished, it shows that their power of contraction is like that of parts with simple or organic muscular fibres. And one may notice here the illustration of the stoppage of hemorrhage from small vessels. In one cut we may divide a hundred such vessels as these on the surface of a stump, and they may cease to bleed in a few seconds:

doubtless, the very stimulus of the knife, while dividing them, has made their walls contract and close.

"But, again, the experiment shows the vessels re-opening and becoming wider than they were before, either yielding more to the pressure of the blood which previously they resisted with more strength, or else dilating, as of their own force, with that which Mr. Hunter called active dilatation, and compared with the act of dilatation of the os uteri. In whichever way the dilatation is effected, whether it be active or passive, the vessels will not at once contract again under the same stimulus as before affected them. The needle may be now drawn across them much oftener and more forcibly, but no contraction ensues, or only a trivial one, which is quickly succeeded by dilatation. Yet, with a stronger stimulus, such that of great heat, they will again contract and close. And such a contraction excited by a cautery may last more than a day, before the vessels again open and permit the flow of blood through them. So that in this we have an illustration of the secondary hemorrhages from vessels, which, after their first closure, have not been sealed by the coagulating blood, or the exudation of lymph,—as well as an illustration of the effect of the cautery or of hot water in again checking such hemorrhages, and more permanently closing up the vessels."

The influence of various agents upon the arteries in the web of the frog's foot has been carefully studied by Mr. Wharton Jones, and the following are his general results:

"1. Constriction may slowly take place, and be slowly succeeded by the normal width. This I have found to be the effect of the action of the sulphate of atropia. A solution of this substance, in the proportion of three or four grains to the ounce of water, applied to the web, causes constriction of the arteries, in about the same time that it causes dilatation of the pupil when dropped into the eye. In other words, it causes contraction of the circular fibres of the muscular coat of the arteries in about the same time that it causes contraction of the radiating fibres of the iris. As in the case of the iris, the arteries slowly recover from the action of the atropia.

"2. Constriction may quickly take place, and be soon succeeded by the normal width, or a width not much exceeding the normal. This has been found to be the effect of the moderate application of cold, mechanical irritation, and galvanic irritation. When a drop of cold water is applied to the web, the arteries are seen to become constricted, but they soon resume their previous state. Slight pressure on the web, with a blunt point, for example, in the situation of an artery, excites constriction of it, but by and by the vessel becomes dilated, as before. When the web is subjected to the influence of a single pair of plates, constriction of the arteries is induced, succeeded by dilatation, as in the preceding cases.

"3. Constriction either does not take place at all, or, when it does, it very rapidly gives place to great dilatation. This is the effect of such agents as the following:—a solution of sulphate of copper (gr. xvj—℥j) with wine of opium (℥j) dropped on the web, I have generally found to cause primary dilatation of the arteries. A strong solution of common salt I have found to have a similar effect, only, perhaps momentary constriction has more frequently preceded the dilitation. Battley's *liquor opii sedativus* usually first excites constriction of the arteries, but dilatation quickly supervenes. A drop of spirit of wine immediately causes constriction, but this is soon followed by dilatation of the arteries.

"4. A dilatation, preceded or not by momentary constriction, may slowly yield to constriction, which remains permanent. This is the effect of sulphate of copper in a concentrated solution. When a point of bluestone is rubbed on the web, in the neighbourhood of, or over an artery, the vessel slowly but steadily becomes completely constricted, and remains so."

[The dilatation is, however, by no means uniform, but presents all the varieties of form which we are accustomed to recognize in aneurisms or aneurismal dilatations of great arteries, and]

Besides their increase in calibre, we find that the vessels of inflamed parts are dilated in length; they consequently become more tortuous, and their pulsations

are stronger than natural, each impulse increasing their tortuosity. This change may be well seen in the vessels of the conjunctiva; in which part, according Mr. Wharton Jones, the small arteries may be recognised by their pulsations, these being manifested by increased bendings as the pulse-waves pass through them. It is felt in the violent throbbing, which is frequently one of the most painful sensations of an inflamed part.

On the whole, then, we may conclude, that the *dilatation of the vessels*, especially of the arteries, with a weakening of the resisting power of their walls, is one of the most constant phenomena of the inflammatory state.

[A change in the rate of movement of the blood affects the supply of blood to the tissues of an inflamed part. There is here also a want of agreement as to the cause and consequences of the retardation, which all believe to be present. There is first undoubtedly, a state of active congestion induced by the application of an irritant, and indeed we may easily imagine this to be the state of many internal organs, when actively discharging their functions. The passage of this state of active congestion into the normal condition, is indicated by the relaxation of the current of blood with a gradual contraction of the vessels, and]

The transition to the inflammatory state is marked by a further retardation of the current, without any diminution, but (it may be) with even an increase, in the diameter of the vessels. This may be observed as the consecutive result of the application of stimuli to the bat's wing; but for the sake of bringing all the phenomena into view at once, Mr. Paget recommends the infliction of such an injury as passing a fine red-hot needle through the membrane.

"The first effect of such an injury (in addition to the charring and searing of the membrane, the obliteration of its blood-vessels, and the puckering of the portion of it adjacent to the burn) is to produce contraction of the immediately adjacent arteries and veins. They may remain closed, or, as I have already described, after being long closed, may again open, and become wider than they were before. This dilatation follows more certainly, and perhaps without any previous contraction in the arteries and veins at a little distance from the burn. In these there speedily ensues such a state of 'determination of blood, as I have already described: in arteries and veins alike the stream is full and rapid; and the greater accumulation, as well as the closer crowding of the red corpuscles, makes the vessels appear very deep coloured. The contrast of two diagrams, showing the natural and the stimulated conditions, illustrates this difference sufficiently well. The vessels of the one, nearly twice as large as those of the other, darker, and more turgid with blood; and, in the one, numerous capillaries which are not visible in the other. But diagrams cannot show the changes in the mode of movement. Close by the burn, the blood which has been flowing rapidly begins to move more slowly, or with an uncertain stream,—stopping, or sometimes ebbing, and then again flowing on, but, on the whole, becoming gradually slower. Thus it may, at length, become completely stagnant; and then, in the vessels in which it is at rest, it seems to diffuse and change its colour, so that its crowded corpuscles give the vessels a brilliant carmine appearance, by which, just as well as by the stillness of the blood, they may always be distinguished. As one surveys an area surrounding this part in which the blood is stagnant, or moves slowly, one sees the streams increasing gradually in rapidity. And often, when there is stagnation in a considerable artery, one may see the blood above or behind it pulsating with every action of the heart, driven up to the seat of stagnation, and thence carried off by the collateral branches: while in the corresponding vein it may oscillate less regularly, delaying till an accumulated force propels it forward, and, as it were, flushes the channel.

"Again, in the same area as that in which the movement is pulsatile or oscillating, and in the area beyond it one sees the full and rapid and more numerous streams of 'active congestion;' and these may extend over a space altogether uncertain.

"Such is the general condition of the circulation round a part thus inflamed; but the varieties in lesser points that may be presented cannot be described. These must be seen; and, indeed, the whole sight should be viewed by every

one who would have in his mind's eye a distinct image of what in practice he must often too obscurely contemplate."

Mr. Paget notices the remarkable continuance of the fluidity of the blood in the vessels, notwithstanding its retardation, or the entire cessation of its movement. "I have found it fluid," he says, "after at least three days' complete stagnation, and so I believe it would remain till it is cleared away, unless the part sloughs. In the latter case, it would coagulate, as it does in carbuncles and the like, which hardly bleed when we cut them through; but, so long as the blood is fluid, though stagnant, it may be driven from the vessels with full force, as soon as an easy exit for it is made by cutting into the inflamed part, or opening one of its veins." This fact is obviously one of the same order with that of the continued fluidity of the blood included in a part of an artery cut off from the current of the circulation, between two ligatures; and it leads, with several others of the same order, to the belief that the continued fluidity of the blood is dependent upon the vital condition of the parts with which it is in contact. It is from this property of the blood that the inflamed part is enabled to return to its natural state, provided the disturbing cause has not acted with too much violence; which would not have been the case if its vessels had become choked up with coagula.

[On the other hand, when the stagnation occasioned by the application of a strong solution of salt becomes dissipated,]

"The flow of blood is observed to be re-established in the following manner: the agglomerated mass of red corpuscles in a given vessel, exposed to the force from behind in the artery leading to that vessel, is seen to oscillate, yielding a little at each stroke of the heart, and again recoiling. If the vessel in question has an outlet into another in which the flow of blood is free, it is seen that the agglomerated mass of red corpuscles, being at last moved onwards, protrudes into the free vessel, the stream in which detaches and carries away the corpuscles composing the protruding part. In this manner, successive portions of the agglomerated mass are carried away, until at last, reduced to a small size, it is all driven onward by the stream from behind into the stream in front, where it is broken up into its constituent corpuscles. The blood has now free course in the obstructed vessel. In this way, one vessel after another is cleared, until the circulation is fully re-established in the web.

"The process just described may be promoted by applying to the web any of the agents above mentioned, as possessing the property of causing dilatation of the arteries, and acceleration of the flow of blood—*even a solution of salt*. It is to be remembered, however, that the solution of salt, for instance, if strong, may exert its property of causing dilatation of the arteries, with acceleration of the flow of blood in vain, in consequence of its tending to keep up the stagnation by virtue of its other property of abstracting water from the blood by endosmose, and thus inspissating the plasma.

"The re-establishment of the flow of blood, in the manner described, is to be attributed to the force from behind operating on the agglomerated mass of red corpuscles, now become loosened by having imbibed the thinner plasma of the blood flowing against it. The promotion of the process, by the applications referred to, is an interesting illustration of the *modus operandi* of stimulating collyria, applied to the eye, for the cure of inflammation of the conjunctiva."

[It has been seen that the first effect of stimulating applications has been to produce contraction of the arteries, and it is commonly stated that with this contraction there is acceleration in the current of the blood. Mr. Paget is fully satisfied that]

"*The velocity of the stream, in any vessel of an inflamed part, is not determined by the diminution or enlargement of the channel.* Without change of size, the stream may be seen decreasing, from extreme velocity to complete stagnation."

[Mr. Wharton Jones attempts to explain the retardation of the blood, to a change in its condition whereby it becomes inspissated by the loss of its serum. the corpuscles thus tending to aggregate together and block up the vessels. We shall first notice the judicious view of Mr. Paget. He says:—]

"On what the alteration of movement of the blood in such a case depends,

I cannot tell; but we have facts enough to justify such an hypothesis as that there may be some mutual relation between the blood and its vessels, or the parts around them, which, being natural, permits the most easy transit of the blood, but, being disturbed, increases the hinderances to its passage. Such hinderances appear to be produced by the addition of salts of baryta, or of potash, to the blood; the presence of an excess of urea in the blood probably produces the like effect: and such facts as these make the hypothesis I have referred to not unreasonable. At any rate, the belief that the more or less rapidity of movement of blood through small vessels may depend on other than evident mechanical relations, cannot appear absurd to any one who has seen the movements of fluid in the Chara, or Vallisneria, or any such plants, in which a circulation is maintained without any visible source of mechanical power."

Mr. Simon obviously entertains the same view. "There exists in the organism," he says, "an arrangement for providing the elements of parts, according to their requirements, with an increased supply of developable blastema." He then goes to show, "that this excess of blastema *in* the tissue depends on an increased afflux *to* the tissue;" and in proceeding to inquire how this is to be accounted for, he proves most satisfactorily that it cannot be dependent upon any *vis a tergo* derived from the action of the heart or arteries, but must be attributed to a *vis a fronte*, arising out of the molecular changes in the tissue itself. This principle has been so little attended to by physiologists and pathologists in general,—Dr. Alison and his followers being those who have most positively upheld it,—that we think it worth while to quote the following portions of Mr. Simon's argument, familiar though it may be to the minds of many of our readers:—

"In the primordial developments of parts, we are able, without difficulty, to satisfy ourselves, that the organs which subsequently become dependent on blood-vessels do not at first grow quite extra-vascularly; and that the prolongation of blood-vessels into their substance (a change which, relatively to their previous state, may be called hyperæmia) only occurs after they have reached a certain maturity; so that if we were to use terms implying the relation of cause and effect between the intimate structure of such organs and their vascularity, we might speak of the structure as determining the vascularity, but by no means of the vascularity as determining the structure; we might speak, for instance, of the ossification of cartilage occasioning its permeation by blood-vessels, since it begins to ossify before it begins to be vascular; but we could not reverse this, and speak of the structural change being determined by the greater vascularity of the cartilage. The change of molecular structure determines the change of vascular supply.

"Guided by this analogy, we are able to draw a similar inference respecting some of the hyperæmial changes which occur in secreting organs: if you remove one kidney, so that there may remain an insufficiency of glandular substance for the excretion of urine, you presently find that the blood-vessels of the remaining kidney have become larger, and that the number of the glandular elements in this kidney have likewise become vastly multiplied. Now (so far as we know anything in physiology) we know that the abundance of cell-growth in an excreting organ is an immediate consequence of the presence in the blood of certain matters which it is the function of that glandular cell-growth to eliminate. We are accordingly led to consider the enlargement of blood-vessels as a secondary phenomenon; subsequent to the multiplied cell-growth; necessary to maintain it; and essentially analogous (as I have hinted) to the process by which blood-vessels were originally given to the embryonic organ, only after it had undergone the first steps of its development.

"I may take this opportunity of making two other remarks, as explanatory of our present subject. First, no variation in the *action of the heart* can account for any distributive inequalities of circulation, the heart acts as a forcing-pump for the whole body equally: it maintains all the vessels in a state of similar repletion; it can contract more forcibly or less forcibly than usual—can give much impetus, or little impetus, to the circulation; but what it does for one organ, it does for all; it can show no preference—can do no more for

gress through the absorbent to the sanguiferous system; and if, on the other hand, we compare the condition of fibrin with that of the *known* products of the disintegration of the tissues, such as urea, kreatine, or extractive matters; we cannot feel the slightest doubt that the fibrinous condition is a stage in the onward course of the nutrient material, and not in that retrograde metamorphosis of the effete matters which we see to be everywhere tending to the reproduction of the conditions of chemistry and physics, to the utter extinction of those of vitality. Now even Mr. Simon will probably allow, that the fibrillation of fibrin is a result of its vital endowments; and we would ask him whether any such endowments can be shown to persist in any substance whatever, which is an undoubted product of disintegration. All the objections which he adduces in the latter part of the extracts we have cited, to the idea that fibrin is ever developed into tissues of high organization, are very easily removed, when the facts are fairly considered. We do not hold the extravagant doctrine that fibrin is capable, by its own inherent endowments, of passing into the higher forms of organization; or of developing blood-vessels, nerves, or other special tissues, apart from the influence of a living organism. The coagulum of fibrin, in blood drawn from the body, presents a very imperfect approach towards the fibrillation of a clot of small size effused within the body, still less towards that of a fibrinous exudation poured out in a thin film upon the surface of a living membrane, or infiltrated into the interstices of a tissue. The further the particles of any such coagulum are removed from a living surface, the more do they correspond with those of a coagulum formed out of the body; and this is why the inner portion of the coagulum of an aneurismal sac does not display the organization which is produced by the outer.

It is admitted on all hands, that a low and simple form of fibrous tissue may be produced by the mere coagulation of fibrin; and this, as we believe, can only undergo development into higher textures, when in such immediate proximity with a living surface as to be able to receive vessels from it. But albumen shows not the slightest vestige of such a tendency to organization; and surely it is more probable, that a substance whose plasticity is thus manifested by its own efforts to assume an organized character, should be the pabulum for the growth of cells, &c., in which higher tissues are formed, than that they should make use of a material which does not exhibit any plastic properties whatever, so long as it remained in the condition in which it has been first introduced into the body. Further, we may remark, that it appears from the observations of Mr. Paget upon inflammatory effusions, that the strongly fibrinous exudations unquestionably rank higher in organic character than those in which cell-formation is more abundant; the latter being characteristic of tuberculous and other cachectic conditions, whilst the former mark the healthy state; and the latter having a tendency to degenerate, whilst the former are disposed to become more completely organized. Again, if the doctrine of Zimmerman and Simon be true, we should expect that the proportion of fibrin would be greater in venous than in arterial blood; whereas, if there be any difference, it is on the contrary side. And again, in diseases which are characterized by a peculiar tendency to disintegration of the solid tissues, such as idiopathic fevers, scurvy, &c., we should expect to find a marked increase in the proportion of the fibrin of the blood; whereas, so far is this from being the case, that unless an intercurrent inflammation be present, the proportion of fibrin in these diseases is below the usual average, and its coagulum is less perfect than in health.

Reviewing our whole enquiry into the alteration of the blood in inflammation, we may briefly sum up its results, by saying, *first*, that there is ample evidence that the presence of a poison in the blood, which disturbs its normal nutritive relations to a particular tissue, may of itself be a sufficient *cause* of inflammation in that tissue; that this cause acts, however, with more potency, when the vitality of the part has been previously depressed by local causes, so that the influence of the poison may be thus caused to expend itself chiefly or solely upon such part; and that there are many cases in which inflammation is produced by local causes, which cannot be conceived to act primarily on the blood: and *secondly*, that the alterations in the general mass of the

blood, which are commonly accounted to be characteristic of inflammation, (such as the increase in the proportion of its fibrin, colourless corpuscles, and water, and the diminution in the proportion of its red corpuscles, albumen, and salts,) cannot be looked upon in any other light than as *results* of the establishment of the inflammatory condition—constituting, in fact, that series of changes in the circulating fluid, which is of parallel order to that which occurs in the solid tissues wherein the inflammatory action has been set up.—*Brit. and For. Medico-Chirurg. Review, January*, 1851, *p.* 127.

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## 135.—INFLAMMATION, &c.

(From a Review of the works of Messrs. Paget, Jones, and Simon, in the Edinburgh Monthly Journal.)

[The following is another abstract of some of the most recent and important views of inflammation and its effects, taken from the Edinburgh Monthly Journal.]

The progress of histological pathology has taught us, that during normal nutrition, the blood in the blood-vessels is continually acted upon by the tissues to which they are distributed. It is in consequence of a force from without, and not as a result of a power from within, that the fluid matters of the blood are continually exuding through the capillaries to build up and maintain the tissues. This force must be a vital force,—selective and attractive,—inherent in the parenchymatous structures of organs and tissues. In health, the blood in the capillary vessels is everywhere the same, and the structure of the numerous capillaries themselves is also everywhere alike. By what possible agency, therefore, can there be selected from this blood, and attracted or drawn through these capillaries, structures and fluids so various? Why should one organ select the materials which form bile, another those which constitute urea, and a third such as will produce the acid gastric juice, if it be not an agency in the first case connected with the cells of the liver; in the second, with those of the kidney; and in the third, with those of the gastric follicles? Again, if these various secretions be unusually increased in quantity, is it not because the selective and attractive force is augmented in energy? Does not hypertrophy of an organ or of a limb imply increased action in the parenchyma of the one and of the other, as the cause of that hypertrophy? If so, we cannot ascribe the increased nutrition primarily to the blood or to the vessels. Besides, do we not know that nutrition is carried on, and the formation of the embryo commenced, in the germinal membrane long before the existence of either blood or blood-vessels? Of this there can be no doubt; and the same observation applies to all new formations, healthy or diseased. Hence the blood-vessels themselves are the results, and not the essential causes, of growth. Increased vascularity always follows, and never precedes, morbid actions.

Now, as regards the subject of inflammation, the great question we have to discuss is this,—Do the various changes which constitute that morbid process essentially depend on perversion of the vital selective and attractive power so necessary for nutrition, or do they depend on altered physical conditions of the blood or blood-vessels? To this question Mr. Paget, Mr. W. Jones, and Mr. Simon have favoured us with three different replies, and we now proceed to examine and report upon each.

Mr. Paget considers that the maintenance of any part by nutrition depends upon four conditions—1st, a regular and not distant supply of blood; 2d, a right state and composition of that blood; 3d, (at least in most cases,) a certain influence of the nervous force; and 4th, a normal state of the part in which nutrition is to be effected. He believes that inflammation may have its beginning in any one of these conditions,—as in an alteration of the blood in rheumatism, in an alteration of the nervous force in irritation of the retina, in an alteration of the proper elements of the tissue in inflammation of the cornea; but that probably it is never fully established without involving in error all the conditions of nutrition. He considers such alterations should be considered as concurrent events, rather than as a series of events of which each

stands in the relation of a consequence to one or more of those that preceded it. Hence, if we understand him rightly, inflammation may sometimes arise from one cause, sometimes from another, but it is only perfected when several altered conditions operate together.

Mr. Wharton Jones's inquiry is limited to the state of the blood and the blood-vessels in inflammation; and the conclusion he has arrived at seems evidently to be, that the changes they undergo are the true causes of that morbid process. He is of opinion that, owing to some physical change in the part, the blood becomes more viscous from an increase of its fibrin. That, in consequence, the blood corpuscles exhibit a great tendency to adhere together, as well as to the sides of the vessels, whereby congestion and stagnation within them are produced; and as a result of this, the vis-a-tergo pressure causes the serum and liquor sanguinis to exude. Hence, according to this author, the well-known increase of fibrin in the blood during inflammation is the primary change, giving rise to a variety of physical phenomena. How this change takes place is not very clearly stated. He points out that, after section of the ischiatic nerve in the frog, stagnation of the blood is not so readily produced in the web as when it is entire. Hence it is not owing to paralysis of the limb. At p. 40, he seems to ascribe it to exosmose of the serum, which may indeed serve to explain the action of saline solutions, but completely fails in the case of other mechanical irritants, such as a grain of sand. He seems to doubt its being caused by solution of the coloured or colourless corpuscles. Indeed, so far as we can discover, this essential point is left in the greatest obscurity.

Mr. Simon is distinctly of opinion, that the first change which occurs in an inflaming or an overgrowing part, and which leads to its becoming loaded with blood, is not a reflex change operating through the nerves, but it is a direct change, effected by the living molecular structure of the part on the blood which traverses it, or on the vessels which convey that blood. The growing elements of the part—hurt by physical violence, or affected by extremes of temperature, or thrown into rapid chemical changes, or overburdened with their own specific stimuli from the blood—strive to grow more, or in their manner of growth to differ from their previous state. The sudden origination of this effort (as it occurs, for instance, after mechanical injury), suffices apparently in itself to derange the currents of the capillary circulation, to flood the tissue with serous exudation (?), and to lead to those phenomena which are considered pathognomic of inflammation. Hence, then, according to Mr. Simon, it is not to the nerves, blood, or blood-vessels, we must look for the primary cause of inflammation, but altogether to the stricture of the part inflamed.

From what we have previously stated, it will be readily understood, that of the three opinions before us, we consider Mr. Simon's to be the correct one. We cannot agree with Mr. Paget, that various causes may operate, or that the changed conditions to which he alludes, must all necessarily concur. A changed state of the nervous influence, and of the blood, may certainly arise, and very commonly does; but this is a result, and not a cause. Then, so far from increased spissitude of the blood always preceding inflammation, we have no proof that this is ever the case. That such spissitude is owing to an augmentation of fibrin, is unlikely, for the facts and arguments of Zimmerman have sufficiently shown, that the increase of this principle is also the result, and not the cause of inflammation,—an opinion which has been adopted by Mr. Simon. The more, then, we examine this question, the more do we feel satisfied that the primary change is in the vital properties of the tissues inflamed. In hypertrophy, their selective and attractive powers are both increased—in inflammation the selective force is destroyed, while the attractive one is augmented in energy. Hence the exudation, thickening of the blood, and the phenomena of congestion and stagnation, which have been so well described by Mr. Wharton Jones. Blood is not sent or determined to the part, as has long been supposed—it is drawn or attracted there; and it is only by using the latter expressions that the real cause of the increased amount of that fluid in inflamed parts can be understood.

Whilst we consider that Mr. Simon's exposition of the nature of inflamma-

tion is, on the whole, very just, he himself must be fully aware that it is in no way original. In point of fact it is the very doctrine which has long prevailed in the Edinburgh school of medicine. It was very ably maintained by Dr. Alison, when professor of the Institutes of Medicine, and is the one which for some years has been taught by the present holder of that chair. Their views, supported by various facts and arguments, have been published, and yet it is curious that while Mr. Simon adopts them, the Edinburgh professors are no where alluded to. Again, whatever differences may exist in opinion between the three authors under review, there is a wonderful unanimity among them in *suppressing* (we use this word advisedly) all allusion to the labours of the Edinburgh pathologists.

An increased attraction of the parenchyma of the tissues affected, being the ultimate cause of inflammation, so far as we can determine it, we may next ask, what constitutes that morbid change—in other words, what is inflammation?

Dr. Alison, in his article "inflammation," in the 'Library of Medicine,' observes, "in order to give the requisite precision to the general notion of inflammation, as a local change of the condition of any part of the body, it seems only necessary to include in it, besides the pain, swelling heat, and redness, the tendency always observed, even when the changes in question are of short duration, to effusion from the blood-vessels of some new products, speedily assuming, in most instances, the form either of coagulable lymph or of purulent matter." We consider this passage to contain the germ of the doctrine afterwards brought forward by Dr. Hughes Bennett, when he maintained that exudation of liquor sanguinis was the essential phenomenon of inflammation. And here it may be observed, that when pathologists speak of an exudation—a term synonymous with that of the Germans (*exsudat*)—there ought always to be understood transudation of the liquor sanguinis through the walls of the blood-vessels. It should be separated from the terms effusion and extravasation, which refer the first to the transudation of serum only; and the second to hemorrhage from the smaller vessels by rupture of their walls.

It is the more necessary to understand this, because we observe that Messrs. Paget and Simon use the terms exudation and effusion synonimously. The former even speaks of inflammatory effusions (!) of blood. Those who speak thus loosely, and who seem to have formed no clear distinction between the *effusion* of serum, the *exudation* of liquor sanguinis, and the *extravasation* of blood, must, indeed, find it very difficult to understand what is meant, when it is contended that the word inflammation ought to be banished from medical language, and the term exudation substituted for it. But this is what the progress of pathology is slowly but surely bringing about.

We feel satisfied that the ultimate cause of inflammation must be sought in a perversion—that is an increased attraction—of the vital forces regulating nutrition in the parenchyma of organs, and not in any physical obstruction of the vessels from within.—*Monthly Journal of Medicine*, *Dec.* 1850, *p.* 527.

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## 136.—ON INFLAMMATION OF THE SYNOVIAL MEMBRANES OF JOINTS.

By Sir Benj. C. Brodie, Bart.

[As to the constitutional origin of these affections Sir Benjamin remarks:]

"Inflammation of a synovial membrane may arise as a local affection, the consequence of a sprain, a contusion, or other mechanical injury. In other cases, various joints being affected, either simultaneously or in succession, it is manifestly the effect of a disordered state of the general system; and even in those instances in which the inflammation is confined to a single joint, a careful inquiry will generally satisfy the surgeon that it has had a similar origin. Indeed I must confess that, in proportion as I have acquired a more extended experience in my profession, I have found more and more reason to believe that local diseases, in the strict sense of the term, are comparatively rare. Local causes may operate so as to render one organ more liable to disease than another; but everything tends to prove that, in the great majority of cases,

there is a morbid condition, either of the circulating fluid, or of the nervous system, antecedent to the manifestation of disease in any particular structure. Moreover, even in those cases in which a disease may be distinctly traced to some kind of mechanical injury, the character which it assumes depends as much on the state of the general health as on the injury itself. Thus we find a sprain of the ankle, in one instance, to be followed by no urgent symptoms, while in another, a sprain, not apparently more severe, is followed by intense inflammation, for the removal of which the most active antiphologistic treatment is required."

In a great number of instances, the synovial inflammation is attributable to a gouty diathesis, evidenced by the existence of lithates in the urine, and according to Dr. Garrod in the blood; or to rheumatic inflammation, accompanied or caused by the predominance of lactic acid in the system (Prout). And the circumstance that such diseases show themselves in the synovial membranes of joints, rather than in the serous membranes which are nearly allied to them, is to be explained by the constant motion of joints, and generally speaking, by their liability to injury from their exposed positions.

[Sir Benjamin insists in the treatment "of the necessity of regarding them as constitutional and not local affections." When the joint is greatly and distressingly distended with serum, it is recommended to make a few minute punctures, and apply an exhausted cupping glass: and as soon as pus is known to have been secreted, to make a free incision into the joint. He then says,]

"If it be a question whether the collection of fluid in a joint be purulent or otherwise, it is prudent, in the first instance, to make a puncture with a grooved needle. If it prove to be purulent, a free opening should then at once be made with a lancet, in a depending situation. It is important that this operation should not be long delayed, lest the matter should make its way out of the joint in other directions, and form irregular and circuitous sinuses among the neighbouring tendons and muscles. It is equally important that the opening should be sufficiently large to allow the matter to flow spontaneously, without it being necessary to have recourse to pressure on the joint. If afterwards there be reason to believe that there is still a lodgment of matter in any part of the joint or among the neighbouring soft parts, the original opening should be dilated, or the surgeon should avail himself of the first opportunity which occurs, of making another opening in a convenient situation; and it will often happen that several such openings will be required before the cure is completed."

The employment of exploring needles (says the Reviewer) has certainly found its chief champion in the writer of the volume before us, and against so great an authority it is difficult to contend. The practice is, however, in our view, a questionable because a dangerous one; and, as we have many times heard it said by perhaps as great a surgeon as Sir Benjamin, need rarely or never be resorted to by a man of tact and experience. We do not of course mean to say, that there is not often extreme difficulty in diagnosing the nature of a tumour, or the contents of a cyst; but we do mean to say, that by unnecessary exploratory punctures, many a malignant growth has been excited to inflame and increase, when it was in a quiescent state."—*Brit. and For. Medico-Chirurg. Review, Jan.* 1851, *p.* 178.

## 137.—PECULIAR AFFECTION OF THE SHOULDER JOINT.

By Sir Benj. C. Brodie, Bart.

[Sir Benjamin describes a most tedious and annoying affection of this joint, seeming to depend in many instances on a chronic inflammation of the substance of the deltoid muscle, or of the bursa under the deltoid, and to be greatly benefitted by the employment of counter-irritation and the iodide of potassium.]

"The cases here referred to occur more frequently in private than in hospital practice: and (whether it be accidentally or not I do not know) it certainly has happened that I have met with it more frequently in the female

than in the male sex. The patient complains of pain, which however is referred not so much to the joint itself as to the arm a little below it, near the insertion of the deltoid muscle. At first the pain is trifling, but it soon becomes severe and constant. The patient describes it as a *wearing* pain, of which she is constantly reminded. It is aggravated by every motion of the limb, and by pressing the articulating surfaces against each other. Not only is there no perceptible enlargement of the shoulder, but after some time, in consequence of the want of use and wasting of the deltoid muscle, it seems to be actually reduced in size. It is not long before the mobility of the joint is impaired, becoming gradually more and more limited. When the patient attempts to raise the elbow from her side, it is observed that the scapula is elevated at the same time with humerus. She is unable to raise her hand to her face, nor can she rotate the limb so as to place it behind her. When the progress of the disease is stopped at an early period, the mobility of the joint may be restored; but otherwise, although the pain and all other symptoms of the disease have subsided, the joint remains stiff, and to all appearance completely anchylosed. Whatever motion the arm is capable of, under these circumstances, depends not on the humerus, but on the scapula; and it is remarkable to what an extent the scapula, or rather the muscles belonging to it, will accommodate themselves to this new state of things, so as to make up for the deficient motion of the shoulder.

"It certainly is seldom that this disease terminates in abscess of the joint, when proper attention has been paid to the treatment of it, nor has this happened in any case in which I have had the opportunity of closely observing its progress. I have, however, seen cases of abscess with ulceration of the cartilages, and complete destruction of the shoulder joint, in which I conclude that, if I had been consulted at an early period, I should have found the symptoms to correspond with those which I have just described.

"Whether it be from this, or from any other disease, that the joint of the shoulder is brought to such an extreme state of disorganization, one result is, that it is liable to dislocation, or, more properly, to sub-luxation in the direction forwards. In one case in which I had the opportunity of examining the parts after death, I found the anterior margin of the glenoid cavity of the scapula destroyed by ulceration, the head of the humerus permanently resting on the ulcerated surface. In another case, in the living person, I found the dislocation to be only occasional, the head of the bone slipping forward so as to make a visible projection in certain motions of the arm, and in certain other motions returning to its natural situation.

"I may take this opportunity of noticing another circumstance, which, though not of much interest in pathology, is of some importance in practice. An abcess originating in the shoulder-joint sometimes presents a peculiar appearance, when it is making its way to the surface. A dissection, which I once had the opportunity of making, will explain at once the nature and the cause of this peculiarity. The abcess, taking the course of the tendon of the long head of the *biceps flexor cubiti* muscle, had suddenly emerged from the joint at the lower end of the bicipital groove of the humerus: then, having taken a direction forward, on the anterior edge of the deltoid muscle, had presented itself under the integuments, having a spherical form, so that it might have been mistaken for an encysted tumour. I met with one case, in which this mistake respecting an abscess of this kind, was actually made by a surgeon of considerable experience, who proposed the removal of the tumour by the knife."—*Brit. and For. Medico-Chirug. Review, Jan.* 1851, *p.* 184.

## 138.—REMOVAL OF LOOSE CARTILAGES FROM JOINTS.

By Professor JAMES MILLER, Edinburgh.

[In his description of the subcutaneous or valvular mode of removing loose cartilages, Professor Miller remarks:]

"In the first place, the patient is to be prepared for the operation. For a day or two, the limb is to be disused, so that previous excitement may have thoroughly subsided. Low diet is enjoined, the primæ viæ are gently yet effi-

ciently cleared, and general secretion is seen to be in a satisfactory state, so that there may be no predisposition to inflammation. Then the foreign body, having been made superficial, is gently pushed to the extreme verge of the synovial pouch; either on the inside or on the outside of the patella, as may be most convenient. The internal position is usually the most preferable; and there it is retained fixedly, by the fingers of an attentive and steady assistant. A tenotomy needle, or thin and narrow bistoury, of fine edge, is passed in an oblique direction; and an incision a little larger than the outline of the cartilage, is made through the tense synovial membrane. The instrument is then withdrawn slowly and cautiously, the finger gently yet firmly following and consolidating its track. A few drops of blood escape, but not a particle of synovia; and no air has obtained admission, even to the areolar tissue. The integumental wound is immediately and carefully occluded, by plaster or collodion.

"The foreign body is then gently pressed through the aperture in the synovial capsule, which aperture, as has just been stated, is made sufficiently free to admit of this being accomplished without force or difficulty. When exterior to the capsule, it is coaxed through the areolar tissue—sufficiently lax, readily to admit of this—by gentle pressure of the fingers; not in the track of the puncture, but in a different direction, probably at nearly a right angle to it. When about an inch and a half, or two inches, from the synovial wound, it is there permitted to remain. Not permanently, however, as has been proposed. Otherwise, acting still more as a foreign body in its recent and raw site, inflammatory action is excited, suppuration is all but inevitable, and extension to the synovial membrane becomes extremely probable; the very result to the avoidance of which all our pains had been directed. For two days, or three at the utmost, it is suffered to remain in its new locality, undisturbed; the most careful prophylactic treatment being meanwhile employed, both generally and locally, so as to avert undue excitement. By that time the synovial wound will have closed by adhesion; and both tracks—that of puncture as well as that of extrusion—will have been consolidated. Then, the substance having been fixed as before, a direct incision is made upon it; not more free than is sufficient for its ready removal. After it has been lifted out, the superficial and slight wound is brought together by strap: and, in all probability, it unites by adhesion."—*Brit. and For. Medico-Chirurg. Review, Jan.* 1851, *p.* 88.

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## 139.—TREATMENT OF ANEURISM BY PRESSURE.

By Professor James Miller, Edinburgh.

[The following extracts on this subject are interesting.]

"No doubt," he says, "some surgeons have experienced remarkable success in tying particular arteries. Mr. Syme, for example, has been very fortunate with the femoral. But it is more than probable that, as in similar sequences of success in lithotomy, and other capital operations, the progress of time will include some disastrous cases, which will not fail to bring down the result to a more ordinary average.

"In tying an aneurismal artery, no skill in the operation can altogether avert risk. Of phlebitis; for the vein usually is in immediate apposition with the artery, and must be exposed to some roughness of manipulation. Of gangrene; for impression on the limb's circulation is inevitably both great and sudden. Of hemorrhage, above all; for the artery tied is necessarily more or less altered in structure and function, and consequently prone to the asthenic results of inflammatory action. Had there been no chronic arteritis, there had been no aneurism. Pressure, unskilfully and rashly applied, is at least equally capable of causing these risks. But pressure, employed according to the principles now enjoined, in its modern revival, escapes them all. . . . .

"That pressure is to supersede ligature altogether, in the treatment of aneurism, no one can imagine. Some patients, by idiosyncrasy, may be intolerant even of such modified pressure as is required; and to some aneurisms the application of it is impracticable. There seems every reason to anticipate

that the result of experience will determine, that some aneurisms are unsuitable for either deligation or pressure, absolutely incurable, by reason of universal and extreme arterial degeneration. And that, of the curable cases, some are suited for pressure, others for deligation; just as, in stone, patients are not indiscriminately subjected to lithotomy, as in former years, but while some are cut, others have the calculus removed by lithrotripsy; neither operation being exclusively followed in the practice of any wise and thoroughly-accomplished surgeon. And further, it will no doubt appear, that there are certain cases of aneurism, in which it were both unwise and unwarrantable to operate by the knife, when experience has shown that pressure will suffice; just as we should be culpable in removing a stone by wound of the bladder, which experience tells us may be safely crushed, or removed by the urethra entire. . . . .

"Mr. Cusack also has communicated to me the notice of dissection in the case of a patient who had been cured of aneurism by pressure in October, 1843; and who died in December last, of diseased brain. The femoral artery was pervious, and of ordinary size, down to the site of the tumour; there its cavity was obliterated, and its coats flattened out into the form and appearance of a ligamentous band. The obliteration extended to about two inches and a quarter, occupying the last inch of the femoral, and the upper one and a quarter inch of the popliteal artery; beneath this point the vessel again becoming pervious, and nearly of its natural size. The profunda and its branches were of ordinary bulk; and the branches of the popliteal were not above the usual dimensions. The vein accompanying the main artery was full of blood, but quite pervious, from the groin down to the lower extremity of the popliteal space. Its external characters were normal throughout; excepting just opposite the obliterated portion of the artery, where the coats of the vein were much thickened and indurated. The internal saphena vein was large, and filled with a fibrinous clot.

"In this case the points of pressure had been in the upper and middle thirds of the thigh, alternately; and it is most satisfactory to have such ample proof of the curative agent having produced no evil effect whatever, on the vessels directly implicated."—*Brit. and For. Medico-Chirurg. Review, January, 1851, p.* 88.

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## 140.—TREATMENT OF PERIOSTITIS.

By Professor Miller, Edinburgh.

[In speaking of this disease the author recommends a practice worthy of a trial. He says,]

"Sometimes action seems to be partially arrested, yet does not decline; a tense and painful swelling remains, unabated, and on the contrary tending still to increase. It is plain that relief of tension would be a most important indication in such circumstances. For a similar state of matters, unconnected with bone, we would freely practise incision; tension would be at once relieved, and action would speedily decline; the wound would suppurate, and its margins perhaps slough, but granulation and closure would speedily follow. Here, however, similar procedure would be rash and untoward. Tension would doubtless be relieved; but, with suppuration, which is inevitable, would certainly come either ulceration or death of the bone; the very results which we seek to avoid. Direct incision, therefore, is plainly unwarrantable. But, by inserting a fine bistoury or tenotomy needle, at a little distance from the tense part; passing it over, cautiously, beneath the integument: then turning and pressing its edge, so as to divide the tense membrane wholly to the desired extent; cautiously withdrawing the instrument, so as to make a valvular, oblique, and subintegumental wound; and finally closing the single integumental puncture immediately, with isinglass plaster, or collodion—in fact by completing the wound so as effectually to prevent introduction of atmospheric influence, and thereby obviating the chief risk of suppuration—we may obtain diffusion of the swelling, relieve tension, and so facilitate both resolution of the action and discussion of its results. This manœuvre, however, requires skill and caution in its performance; and even with these is not wholly devoid

of risk. It is therefore not to be indiscriminately employed, but should be reserved for those cases which otherwise prove obstinate, and in which aggravation and suppuration seem imminent.—*Brit. and For. Medico-Chirurg. Review, January*, 1851, *p.* 87.

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## 141.—ADVANTAGES OF AN ELASTIC CONVOLUTED SPIRAL BANDAGE, IN VARICOSE VEINS AND ULCERS OF THE LEG.

By James Startin, Esq.

[Mr. Startin states that from the many hundreds of cases occurring before him annually, as Surgeon to the Hospital for diseases of the skin, he has observed the advantage of the convoluted spiral bandage over the customary mode of treatment. It is a modification of the plan recommended many years ago by Whately.]

In the following brief remarks on this novel surgical appliance, it is unnecessary to insist upon the causes, or describe a varicose ulcer; suffice it, therefore, to say, that an inability to support the column of blood in the superficial veins, owing to the faulty action or destruction of their valves, constitute the chief cause; and it is to supply this deficiency by the artificial substitute of a convoluted spiral strip of vulcanized Indian-rubber, which comprises the plan I am desirous of testing by professional experience and opinion. It may be well, however, to premise, that this treatment is specially advocated for those varicose ulcers only which are not complicated with extensive erythema, eczema, impetigo, psoriasis, or other disease of the skin of the leg, and that it will probably be found most useful in that varicose sore, so well characterized by Sir E. Home as "a species of ulcer which is seldom very deep; when it spreads, it is generally along the surface; its shape is commonly oval, the ends of the oval pointing vertically; the edges of the surrounding skin are commonly neither thick nor irregular, but are imperceptibly lost in the ulcer," &c.—(Home on Ulcers, p. 275). Yet it may be borne in mind, that, providing varicose veins are present, and other disease of the skin of the leg is not present, beyond the ordinary œdema or erythema surrounding nearly every ulcer, that the convoluted spiral bandage will exert a beneficial effect, and be found applicable; and this is the case whether the ulcer be round, oval, or irregular, deep or superficial, irritable or indolent, cicatrizing or sloughing, single or several, painful or otherwise; for this bandage interferes with no dressings or manipulations, nor does it conceal the wound, or hinder the application of any other roller, poultice, or remedy,—its sole office being to supply artificially the place and functions of the imperfect or deficient valves, and thus divide the column of blood as obtains in the normal condition of the limb; and I believe it will be found to accomplish this most desirable end most effectually, whilst, at the same time, it constitutes a cool and agreeable support for the leg, and removes that undue tension of the skin so commonly found complicated with varicose ulcers, by furnishing numerous *points d'appui*, and tending thus to prevent or avert those specific diseases of this membrane before referred to which are produced, or materially augmented by a tense state of its parts.

From what has now been stated, it will be understood that the convoluted spiral bandage may be combined with any other treatment, local or general, furnished by experience, or deemed advisable in the cases wherein the apparatus is to be applied; so that it may be regarded as an adjuvant rather than as the *sine qua non* of the treatment; and, when employed with this view, I have much confidence that its value will be generally allowed and appreciated. Before proceeding to describe it, however, it may be well to mention that, during its employment, lotions containing a little purified glycerine (℥ ss. ad ℥ viiss.) to prevent their drying, and slightly medicated with nitric acid, yellow or black wash, have in my experience proved more useful and suitable applications than plasters or ointments; and I prefer the following method of using these liquids:—A small piece of *bibulous paper torn from the sheet into the size and form of the ulcer* (the object of which is to furnish a soft, smooth surface, and to prevent the dressing sticking to the sore) is first to be wetted

with the lotion, and then placed upon the ulcer so as barely to cover its edges; over this a pledget of lint or linen wet in the same solution is next to be laid, and this should be large enough to cover every portion of the discoloured or inflamed skin surrounding the wound. This dressing, when thus applied, may or may not, at the option of the operator, be secured with a turn or two of the common calico roller, wet with the same liquid; and over all is to be placed the convoluted spiral bandage, in the manner I will detail after having briefly described its nature.

This bandage may be manufactured of two or more qualities, according to the class of patient on whom it is to be applied, or the cost to be incurred; the best kind for ordinary use consists of half or three-quater inch wide elastic band or webbing of vulcanized India-rubber covered with silk or cotton, two yards and a half long, or four or more yards in length, when the external saphena vein is to be supported to its entrance into the falciform opening of the fascia lata. At one end of this narrow band, a piece of strong silk binding, six or seven inches long, the ends of which are to be sown together, is fixed obliquely, so as to form a sort of loop or stirrup into which the foot is to be placed; the other end of the band is sown at right angles into the middle of a yard or more of similar binding, which serves, after the fashion of a garter, to fix the bandage below or above the knee or round the pelvis when the spiral turns are completed.

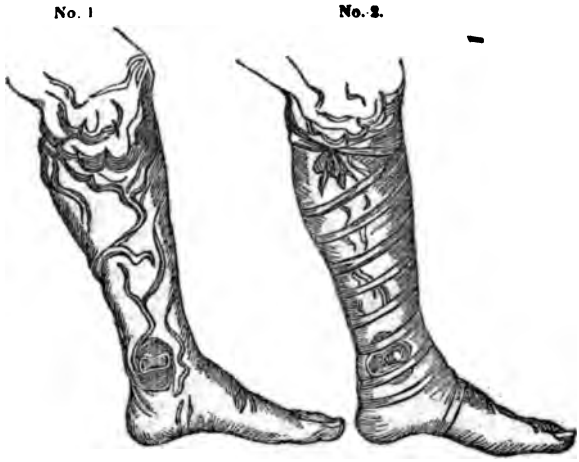
This simple arrangement constitutes the entire apparatus; the webbing or band of which it is composed costs from 1s. to 4d. per yard, according to whether the vulcanised thread constituting its foundation be covered with silk or cotton, or is finely or coarsely manufactured; but another still cheaper and equally efficient method of constructing these bandages exists, which is also the one employed in my public practice; that is, to take a piece of (No. 36) patent vulcanized India-rubber sheeting, of any width, and two and a half yards long, on which parallel lines half or three-quarters of an inch apart are to be marked, so that it may be accurately cut into strips of this width; the incisions should be commenced on these lines alternately, at a distance of three inches from each end of the piece, the object of which is to leave a portion of double the breadth at the end of each bandage, so as to form a loop or stirrup for the foot, as before described. The wider portion of the bandage being properly fashioned, and an opening made in it to fit the instep, either with scissors or a stamp made for the purpose, the apparatus only requires, to render it complete, a yard or so of cotton binding, of the same colour as the vulcanized sheeting to be fixed at the opposite end of the band, as mentioned when the webbing is employed. The cost for each bandage thus constructed amounts only to sixpence or eightpence.

The method of applying the convoluted spiral bandage, and its effects upon the varicose veins and the sore, will be best understood by reference to the subjoined drawings, by my friend staff-surgeon Pilleau, made from a patient who had been under treatment with it for some few weeks. The case has been chosen, not so much to manifest the rapid improvement of an ulcer of many years' duration and great extent, as to demonstrate the mode in which these sores heal, and the marked effect of the bandage in almost obliterating the appearance of the large varicose veins over which it is applied, and which has been represented without exaggeration or diminution.

From the sketch it will be perceived, that the loop of the bandage is first over the instep, so as to bring the commencement of the elastic band immediately under the outer ancle, which situation is to be preferred, although it can be applied under the inner ancle, should an ulcer or other peculiarity require it. In the plate No. 1, the ulcer represented in the lower third of the leg was originally of the usual oval shape, as will be seen from the part lightly shaded; it was then fully double its present size, and the ends of the oval pointed vertically. These are now transverse, showing the usual effect of this bandage, but owing to the patient's neglect, and several days' standing at the "wash tub," the edges of the sore had become a little elevated, and the healing process had been slightly interrupted. On referring to plate No. 2, it will be seen that two turns of the spiral bandage are made before reaching the sore,

the upper turn passing close beneath its lower border, whilst the next or third turn is taken immediately above it; the bandage being then obliquely continued at equal intervals of three quarters of an inch, to an inch or more, until it reaches the knee, where it is fixed by a turn or two of the binding acting as a garter.

No. 1 No. 2.



This is the general arrangement which I have found it best to follow, as the long column of blood in the external enlarged veins by this means is divided into eight or more short columns, and, consequently, the capillaries of the ulcers are relieved to the extent of this division of the pressure upon them, while much of the tension is taken off the entire skin of the leg, by the blood being caused to pass inwards by the deeper veins, and collaterally by the smaller venous branches. From such a disposition of this simple contrivance, the parts concerned in the reparation of the ulcer are left in comparatively a normal state, and it is surprising how quickly reparation commences when no constitutional cause is present to interfere with the process. The means of cicatrising in sores thus circumstanced, is, however, somewhat peculiar, and in deep ulcers much resembles what is seen in the reparation of the bone, *i. e.*, the base of the ulcer often heals, leaving an indented cicatrix, the exact form of the sore remaining, as it were, impressed into the surrounding skin, as witnessed in plate (Fig. 1,) although it will be observed, that the lapse of a few months commonly serves to obliterate this appearance.

I trust, from the details now given, that most of the advantages of the proposed plan will become apparent; but there are a few not quite so obvious, which may deserve a passing remark, as they more particularly concern the poorer class of patients—this being more especially the poor man's bandage. The first is, that rest is unnecessary during the treatment, and the extreme ease and readiness with which the bandage may be put on the leg, and the pertinacity with which it retains its position under every motion of the limb, render it peculiarly applicable to this class of patients. The next is the facility that exists of applying poultices or the ordinary dressings of the wound, without removing the bandage, all that is necessary in the former case being to put the poultice over the bandage, whilst in the latter, the lower spiral turn of the band next the ulcer, may be drawn from the leg, and the dressing put upon the wound, and then fixed upon its position by letting the elastic band resume its place, when the same process may be repeated with the turn of the bandage immediately above the ulcer, by which means the ordinary tedious process of dressing is reduced to a minute's duration, and the varicose veins have the uninterrupted support of the bandage for any time that may be desired; ablutions, baths &c., may also be used without disturbing, and with but very little hindrance from the bandage.—*Med. Times, March* 15, 1851, *p.* 285.

## 142.—GENERAL REMARKS ON THE DIAGNOSIS OF TUMOURS OF THE NECK.

By Dr. P. Redfern.

This always presents great difficulties when the tumours are of large size, only slightly painful, and fluctuate indistinctly. If a complete and accurate history of the case cannot be obtained, more than a general diagnosis may be impossible; but when the precise position of the tumour at its commencement can be made out, when its relations to the larynx and trachea, and its mobility in regard to them and the surrounding parts when it was of small size, can be ascertained, together with the rapidity and manner of its growth, there will be little difficulty in arriving at a satisfactory conclusion.

A *tumour* developed in the substance of *the thyroid body* presents itself in the front of the neck, is usually larger on one side than the other, is firmly connected with the larynx and trachea, moves freely with the larynx in deglutition, and when it is displaced laterally by manipulation. The other features vary with the nature of the tumour.

*In ordinary bronchocele* (hypertrophy) the swelling is soft, projecting, elastic; without fluctuation, pain or tenderness on pressure; it occurs usually in early life, in the female sex, and in particular districts of country; it is simple in its nature throughout, and presents no tendency to degeneration or change of structure; it in no way interferes with respiration or deglutition, nor does it affect the patient's health or comfort until it becomes of very large size, when difficulty of respiration and deglutition, with frequent headaches, occasion the greatest distress, and may end with the death of the sufferer.

In *cystic disease of the thyroid* the nature of the tumour becomes manifest, sooner or later by the presence of fluctuation in one or more cysts, by a glairy, serous, or sero-sanguineous fluid escaping readily along a grooved needle when introduced, the fluid containing no cellular formations when examined microscopically, or having such a structure as is inconsistent with the idea of the existence of cancer,—by the formation of the tumour taking place at or after the middle of life,—by its slow and painless growth, and by the slight inconvenience it occasions as long as its size is not very great.

*In cancerous disease of the thyroid* (usually scyrrhus) the tumour appears between forty-five and sixty-five years of age, is of great and uniform density, and generally painful; it is developed rapidly, and may attain a large size in the course of a few months; it accompanies the larynx in its movements, but shortly limits their extent by attaching the organ to the surrounding parts; it occasions great difficulty of deglutition and respiration from an early period;—hoarseness, cough, and spasmodic action of the muscles of the larynx and pharynx come on and increase in their intensity,—the distress and anxiety of the patient, his sallow complexion and emaciation, marking him out as the subject of a steadily advancing and destructive malady.

In *medullary cancer of the thyroid* the surface of the tumour may be even and tense, or indistinct fluctuation may be perceived, the other characters depending on the steady infiltration of the surrounding textures, distinguishing the disease from other tumours of the same part.

*Enchondromatous tumours* are to be recognized by their great density, the slowness of their growth, and the absence of any signs of the extension of the affection to the surrounding parts, and of general evidence of the existence of malignant disease.

The diagnosis of *tumours of the neck, not connected with the thyroid body*, is to be established by reference to the general characters which distinguish them in other situations, every particular of their history and mode of growth being carefully ascertained as essential points, and sufficient care being exercised lest the presence of a quantity of coagulable fluid, in the interior of a cancerous tumour, lead to the belief that it is of a cystic character.

I shall complete this paper by a short consideration of the important question,—*Whether or not fibre is an essential element in the structure of cancer?*

Much difference of opinion still exists as to what are the parts of a cancerous growth which are essential to it. Professor Bennett states that fibres, cells, and a viscous fluid, are the three essential elements of a cancerous formation.

Lebert regards the cancer-cell as the only distinctive, constant, and essential element, the predominance of one or other of the accidental and secondary elements determining the varieties of form and appearance; yet he regards the fibres as next in point of importance and frequency, and speaks of them in encephaloma as pale, fine, and in small quantity. Muller says that the fibres of encephaloma are indistinct, and that the fusiform cells are arrested in their development into fibres; whilst Vogel states, that in encephaloma fibrous structures are wholly absent. As has been before remarked, it is excessively difficult to state whether the fibres which are found in many tumours are really cancerous, or whether they belong to the proper structure of the organ in which the tumour has been developed; and, consequently, careful examinations of cancerous formations in organs which contain no fibrous tissue in their healthy state, become of extreme importance in leading to a true determination of the mode of development and actual position of the fibrous element in cancer.

From the examination of cancer of the brain, and of numerous cases of encephaloma, I am led to believe that fibres are by no means invariably to be found in such growths, and that their fibrous element is accessary and non-essential. If this be so, the existence of fibrous tissue in most cancerous structures remains to be accounted for in either of two ways,—viz., by hypertrophy of the normal fibrous tissue of the part, or by a new development of fibre from the recently-diffused blastema,—a development commenced and completed under the influence of the determining energy exercised by the fibrous tissue of the part itself, agreeably to the law of analagous formations. Presuming that the fibrous element of cancer is developed in either of the methods just indicated, its absence in cancer of the brain is readily accounted for, as in that organ there is no fibrous tissue to acquire an unusual development, or to determine the formation of new tissue of its own kind from cells. *If* proper *cancer cells*, of a fusiform shape, *ever become transformed into fibres*, their presence in cancer of the brain, unaccompanied by the fibrous element, may be owing to a deficiency of the stimulus necessary to ensure such development, and may possibly be dependent on the absence of fibres in the original and healthy texture of the organ. —*Monthly Journal of Med. Science, Dec.* 1850, *p.* 523.

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## 143.—CORPULENCE; OR EXCESS OF FAT IN THE HUMAN BODY.

By Dr. Thomas King Chambers.

Obesity, or *polysarcia*, is a true hypertrophy of the tela adiposa, an increased growth, without change in chemical or anatomical characters; in this it is in marked contrast with another condition, the *fatty degeneration*, which is rather an atrophy than a hypertrophy, the tissues of the affected organs being replaced by a substance lower in the scale of vitality. The microscopical characters of the fat in these two cases clearly indicate the fundamental distinctions. In obesity the fat is *vesicular;* in the fatty degeneration it is *molecular*. Each vesicle, in natural fat, is a perfect organ in itself, having a distinct wall, and being supplied on its exterior by capillary blood-vessels. The vesicles are round or oblong, but assume a polyhedral form from compression. "Mr. Paget has pointed out an interesting peculiarity of the fat vesicles, namely, that their contents, though fluid, do not pass by exosmosis through the membranous walls. This he ingeniously explains, by noticing that the membrane is moistened continually by the same fluid which all tissues imbibe from the blood-vessels—that is, water containing albumen and salts in solution. With this the oil has no disposition to mix, and thus each drop is imprisoned in a vesicle of impermeable tissue. During life, the oil-cells, by the attraction of their walls, constantly imbibe this watery fluid from the capillary vessels that surround them; and after death, if fat be kept in or near water, no oil transudes till the cells decompose. They retain their contents, on the same principle that an oil-skin bag holds water; the one is rendered water-proof by oil, and the other oil-proof by water. The fluid thus enclosed in an impermeable sac, being incompressible, is highly elastic, and diffuses pressure equally in all directions. It is similar, in fact, in its construction, to a water pillow; and is similar in its use too, for, distributed about the

sole of the foot and the nates, it enables us to stand or sit with easy comfort, without the fear of squeezing out the oil from the tissue. The membrane is supplied with this necessary watery fluid by the capillary blood-vessels, which ramify in great abundance among the vesicles, forming loops around each, and detaining the blood as long as possible in their vicinity. When the vesicles increase in number, these blood-vessels increase in number also, and appear capable of almost indefinite multiplication. How great must be the effect of this upon the circulation! If, for instance, a man of five feet two inches, whose healthy weight would be eight stones, increases to twenty-eight, no less than twenty stones of additional fat have to be supplied with capillaries and those capillaries have to be supplied with blood by vessels constructed to circulate but one-third of the quantity. How wonderful must be the power of adaptation which can render such a change consistent with life at all! How little cause for surprise, if that life is short, and burdened with innumerable ills!"

The uses of fat appear to be to act as padding, filling up angular cavities, and facilitating motion, to defend from external cold, and to form a storehouse of carbon for the use of the lungs. It is derived directly from oleaginous articles of food, and indirectly from some other proximate principles, as the saccharine. But, for its formation, it is necessary that the materials be digested in a greater quantity than is sufficient to supply carbon to the respiration. There has been much difference of opinion regarding the means by which the oily matters are taken up by the lacteals; but experiments performed by Dr. Chambers on rabbits seem to set the matter at rest, and to show that the pancreatic juice is the agent.

The desire for oleaginous food is not equally strong at all periods of life; children commonly dislike it; the taste appears to be acquired about the time of puberty, and in a more marked degree in females.

A certain amount of fat is necessary for the perfect well-being of the individual, while an excess is injurious. It is, therefore, of some moment to determine the best way of ascertaining this point. Dr. Chambers believes that the balance is the best test, seeing that its indications are chiefly modified by the quantity of fat, the bones and muscles having comparatively little influence. This is illustrated by several examples, for which we must refer to the original work, as well as for the tables showing the average weights in healthy subjects, in obese persons, and in phthisical patients.

Corpulence is in a very marked degree hereditary. From the tables constructed by Dr. Chambers, it appears that the tendency was referable to their ancestors in twenty out of the thirty-eight cases quoted; in five more, it was to be seen in their collateral relations; in six only was it absent, the rest being doubtful or unknown. In insanity, 13 per cent. is the full proportion; in consumption, according to the first report of the Brompton hospital, 24½ per cent. Of the *exciting causes*, an acute attack of illness appears to be the most common. Accidental surgical injuries also frequently produce it; and so, too, good living, with moderate exercise and an easy mind.

"The most interesting way of illustrating the pathology of obesity, will be to detail the causes of death in a considerable number of cases of this affection. I have put together sixty-nine, of which the *post mortem* records are thoroughly to be trusted, sixty-seven having been examined at St. George's Hospital, and two by Dr. Shearman, of Rotherham, a gentleman of well-known accuracy and research.

CAUSES OF DEATH IN SIXTY-NINE CORPULENT PERSONS.

*Medical Cases.*

| | |
|---|---|
| Dropsy ... ... ... ... ... ... 13 | Aneurism, 1; malignant disease, 1; fever, 1; rupture of stomach, 1; polypus uteri, 1 ... ... ... ... 5 |
| Apoplectic Coma ... ... ... ... 11 | Erysipelas of face ... ... ... ... 1 |
| Pneumonia ... ... ... ... ... 5 | |
| Pleurisy (acute, 2; chronic, 1;) 3 | |
| Fainting (fatty atrophy of heart) 1 | |

*Surgical Cases.*

| | | | |
|---|---|---|---|
| Peritonitis after hernia ... ... ... | 8 | Secondary abscess ... ... ... ... | 3 |
| Erysipelas after ulcers and slight wounds ... ... ... ... ... ... | 3 | Nephritis after lithotripsy ... ... | 1 |
| Gangrena senilis ... ... ... ... | 2 | Diseased prostate ... ... ... ... | 1 |
| Diffuse cellular inflammation ... | 2 | Accidents ... ... ... ... ... ... | 10 |

"The heart was examined in fifty-seven of these patients. In seven it was found healthy—viz., in four who died from accidents, in one case of rupture of the stomach, one of hernia, and one of nephritis. In the latter case, the principal local collection of fat was about the kidneys, where the amount usually found was greatly augmented. In fifty of the fifty-seven cases where the heart was examined, it was found diseased. Of the fifty diseased hearts,

| | |
|---|---|
| 5 were hypertrophied and not dilated, | 26 dilated only; |
| 8 hypertrophied and dilated | 11 atrophied. |

In sixteen of these, there was an increased amount of vesicular fat about the heart—viz., In 13 of those which were dilated;
In 2 of those which were atrophied;
In 1 of those hypertrophied and dilated.

"In fourteen instances, the kidneys were also affected with chronic degeneration, which, in all those, where an opportunity occurred of forming an opinion, seemed to be consecutive on the cardiac disease.

"A cursory glance over the facts recorded in these lists will be sufficient to show what a great influence over life the disorders of the circulating system have had. In the medical sense, the two classes which make up the bulk of the whole, may be referred entirely to this source; and in the surgical cases, nearly all are of a nature to be much aggravated by an ill-balanced distribution of blood.

"The change which most commonly affects the heart is dilatation, probably dependent on the greatly increased quantity of capillaries distributed throughout the body, and the consequent increase in the amount and pressure of the circulating fluid upon the central organ. The hypertrophy, which sometimes ensues, is not unlikely to be an effort of nature to supply force in proportion to the increased demand.

"In eleven cases out of the forty-nine, atrophy of the heart was observed, that is, diminution in the thickness of the walls, without any external augmentation of size; and in such of these cases as were submitted to the test of microscopic examination, a deposition of *molecular* fat, destruction of the nuclei, and other evidences of degenerated muscle were found.

"We must be careful to distinguish this fatty atrophy, or degeneration, from deposition of *vesicular* fat; the first arises from deficient nutrition, the second is due to excess. One is a retrogression from a more highly endowed tissue to one less distinguished by its importance and offices; the other is an increased growth. It is true, they may be coincident, as in the instances before us of atrophied hearts in obese people; yea, they may exist together in the same organ, as in two of these cases, where there was much fat at the base of the great vessels and degenerated muscle at the same time. But still they are contrasted conditions, hypertrophy and atrophy of different tissues.

"It still remains to be explained, why these two opposite states are so often associated together; why degenerated muscle is more common in fat than in thin people, as would appear to be the case, from a paper presented by Dr. Quain, a short time back, to the Medico-Chirurgical Society."

In regard to treatment, Dr. Chambers observes: "The first thing indicated in all cases is to cut off, as far as possible, the supply of materials. Fat, oil, butter, should be rigorously interdicted in the diet table. But all eatables should contain some portion of oleaginous matter, and especially those most convenient to advise the use of for a lengthened period. And, as we observed at the former part of our review of the light which chemistry has thrown on the subject, almost all are capable of a transformation into fat, when a small quantity of this substance is previously present. It is desirable, therefore, that the mass of food should lie in the stomach as short a time as possible, in order

that at least a fatty fermentation may not be set up in it. Very light meals should be taken, at times most favourable to rapid digestion, and should consist of substances easy of solution and assimilation. To this end, the time of the meals should be fixed for an early hour in the day, before exertion has rendered the power of the entrails languid and weak. Breakfast should consist of dry toast, or, what is still better, sea biscuit, and if much active exercise is intended, a small piece of lean meat. Dinner at one, on meat with the fat cut off, stale bread or biscuit, and some plain boiled macaroni, or biscuit pudding, by way of second course. . . . Liquids should be taken, not at the meal, but half an hour after, so as not to impede the action of the gastric juice upon the mass. Here should end the solid feeding for the day; no second dinner or supper should follow, nor, indeed, any more meals be taken sitting down. A piece of biscuit and a glass of water can be taken standing up, if faintness is experienced; a cup of gruel, or a roast apple before going to bed. . . It is often advisable to add a small allowance of malt liquor at dinner, as otherwise the craving of the appetite is less easily appeased." Among medicines, the *liquor potassæ* stands preeminent. It should be given freely in milk, beginning with half a drachm, and raising the dose to a drachm or a drachm and a half, three times a day.—*London Journal of Medicine, Dec.*, 1850, *p.* 1166.

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## 144.—THE BEST PREPARATION OF ARSENIC FOR INTERNAL ADMINISTRATION, AND THE CHEMICAL COMPOSITION OF FOWLER'S SOLUTION.

By Lloyd Bullock, Esq.

[It is stated by many who employ the officinal preparation of arsenic that it is uncertain in its action, a small dose in some cases acting with violence, and in others a larger dose producing little effect. Though this is rather referrable to peculiarities of constitution in the patient than differences of preparation of the drug. Nevertheless, the present state of chemistry demands in all cases precision—rejection of all processes vague in themselves or admitting the possibility of failure to obtain the intended result.]

In the instance of the solution of a metallic salt, the maintenance of a certain standard strength being always the desired object, it is certainly always desirable, if possible, first to obtain the salt in a crystalline form, and then, being assured of its purity, both by its chemical and physical characters, to dissolve it in an exact amount in the necessary proportion of menstruum. On this principle I have for several years recommended the employment of the arseniate of soda, a salt which has all the required characters of great solubility, definite form, and the additional pharmaceutic advantage of being readily made into pills, in such a manner as to ensure every pill containing any given fraction of a grain with perfect accuracy. Moreover, it may be kept in a crystalline form, and dissolved readily, as it is required. Of the arseniate of soda I have received reports from a great many practitioners, invariably favourable as to its therapeutic effects.

The use of arseniate of soda in medicine is nothing new. It is the basis of Pearson's solution, which consisted of one grain of arseniate of soda to one ounce of water. What the reasons may be which led to this salt having been hitherto omitted from the pharmacopœia, I am unaware.

About twelve months ago, my attention was particularly directed to the liquor arsenicalis by a physician, who was dissatisfied with its effect and, at his suggestion, I was induced to look more closely into this preparation. The directions of the Pharmacopœia for preparing liq. arsenicalis are as follows:—

"Take of arsenious acid, broken into small pieces, carbonate of potassa, each eighty grains; compound tincture of lavender, five fluid drachms; distilled water, a pint. Boil the arsenious acid and carbonate of potassa with half a pint of the water in a glass vessel until they are dissolved. Add the compound tincture of lavender to the cooled liquor. Lastly, add besides, of distilled water, as much as may be sufficient, that it may accurately fill a pint measure."

I made the following experiment:—

1, Taking 80 grains of arsenious acid in coarse powder, 80 grains of carbonate of potassa, P.L., and 10 ounces of water, I found a perfect solution effected on heating, to 212°, with the evolution of only a trace of carbonic acid.

2. The solution was then boiled until it ceased to give off carbonic acid; it required about twenty hours, an equivalent of the carbonate if potassa was decomposed, forming arsenite of potassa, corresponding with the following formula:—

| $As O^3$ | $K O, C O_2, 1\frac{1}{2} H O$ | | $As O_3$ | $K O, C O_2 1\frac{1}{2} H O$ |
|---|---|---|---|---|
| 99 : | 83.5 | :: | 80 :: | 67.5 |

It would appear, therefore, that the liquor arsenicalis of the Pharmacopœia is a solution of arsenious acid in carbonate of potassa, with a minute quantity of arsenite of potassa. On looking through all the dispensatories, and commentaries on the Pharmacopœia, I was surprised to find no allusion to this fact. Soubeiran, however, notices it, but no other French writer on pharmacy subsequent to Soubeiran, that I am aware of.

If it be desirable to give arsenious acid with carbonate of potassa, the following process will give a uniform preparation;—Take eighty grains of arsenious acid in coarse powder; eighty grains of carbonate of potassa, P.L.; compound tincture of lavender, five fluid drachms; distilled water sufficient to make up twenty ounces. Boil the arsenious acid in fifteen ounces of water until dissolved, remove it from the fire, allow it to cool a few minutes, and add the carbonate of potassa dissolved in four ounces of cold water; when the temperature of the mixture is reduced to 60°, add the compound tincture of lavender; lastly, make up exactly to twenty ounces with distilled water.

It is probable that many gentlemen may wish to prescribe a true arsenite of potassa, a salt they supposed they were exhibiting in the liq. arsenicalis of the Pharmacopœia. To distinguish this salt from Fowler's solution, it may be called liq. potassæ arsenitis neutralis, and instead of sp. lavand. co., a small quantity of a distilled spirit could be used. The liquor potassæ arsenitis neutralis may be prepared by taking 80 grains of arsenious, and 67.5 grains of carbonate of potassa, P.L., or 81.6 grains of crystallized bicarbonate of potassa. Boil in ten ounces of water until no more carbonic acid is evolved; when cold, make up to exactly twenty ounces, with distilled water, and if thought desirable, a small quantity of distilled spirit.

There appears to be a variety of opinions as to the best form of giving arsenic. Mr. Hume and others, vide 'London Medical and Physical Journal,' vol. xxiv., would prefer binarseniate of potassa, but I find that this compound, which was admitted into the former edition of the Dublin Pharmacopœia, has been recently omitted.

The binarseniate of potassa is a beautiful salt easily prepared; keeps well, and from its fine crystalline form its purity is readily ascertained. It would be well if some satisfactory reasons were given for the rejection of this salt.

M. Boudin considers a simple solution of arsenious acid in distilled water as the best; whilst Bieto prefers arseniate of ammonia. There is also a solution of arsenic in some repute, known as De Valangin's solution of solvent mineral, which is a solution of arsenious acid in hydrochloric acid.

It appears to me that the weight of testimony is in favour of arseniate of soda. M. Cazenave speaks highly of it; and upon the whole I should say it is probably milder in its action than other forms of arsenic, and, as far as I know, is devoid of objection.

The best method of administering the arseniate of soda is in the form of pills, made up with crumb of bread, or some inert powder.

In conclusion, I think I cannot do better than quote Dr. Powell, who, writing on arsenic, observes, "when the dose is small, and the effect so powerful, the most minute attention to its proportion and preparation becomes necessary."—*Lancet*, *Dec.* 21, 1850, *p.* 674.

## 145.—USE OF ARSENIC IN LUPUS.

By Thomas Hunt, Esq.

There are two very distinct diseases to which the term *lupus* has been applied by the French writers. One of them (*lupus non exedens*) is a cutaneous disease which rarely ulcerates, and its ravages are generally confined to the dermis. The other (*lupus exedens*) is a disease characterised by a very slow ulcerative process of the phagedenic kind, which begins in the skin, eating away not only the dermis but subcutaneous tissues down to the very bone. It commonly commences on the nose, and has been known to destroy every feature. For both of these diseases (which have always been pronounced incurable by medical writers), I have for nearly fourteen years been trying the internal administration of arsenic. Both diseases are very rare, and during the above-mentioned period not more than twenty cases have fallen under my immediate observation. Some of the cases of lupus exedens have already been published, and the whole of them are full of interest and instruction. More recently several cases have been reported to me as having been restored by the use of arsenic, and one or two have recovered by the use of other means. It is gratifying to reflect, that this horrible disease, which has been known to be devouring and mutilating the features of a handsome female for upwards of thirty years together setting all treatment at defiance, and thus proclaiming the helplessness of our art, should at length be placed on the list of curable diseases.

Arsenic has been used as an external application in lupus exedens for many years, with temporary benefit, which has been attributed to its escharotic properties; a more healthy surface having usually been apparent on the separation of the eschar. This improvement having always proved but of short duration, I began to suspect that it resulted rather from the absorption of the arsenic into the system than from any local influence. Accordingly, I determined on a lengthened trial of its internal exhibition. This experiment was attended with the most happy results. A very short outline of a few cases will convey to the reader a general view of the effects of this powerful agent in lupus exedens.

Case 15.—*Lupus Exedens.*—In this case the disease had existed for nine years. The patient took arsenic regularly for three years, when the diseased parts were entirely healed. A relapse occurred in seven months. The arsenic was then resumed, and continued for two years, when the disease again disappeared and has shown no disposition to return for the last eight years. The lower half of the nose, the septum, the four upper incisors, and a portion of the upper lip have been sacrificed by the destructive process. The general health is uninjured. Preparation—liquor potassæ; dose—five minims, gradually reduced to two, thrice a day.

Case 16.—*Lupus Exedens.*—The disease had existed *twenty-four* years, and was arrested by arsenic in *two-months*; after which period the skin remained irritable, but no ulceration appeared. The patient has now been free from lupus for four years, having taken arsenic occasionally for three years. The tip and septum of the nose, and the greater part of both alæ, are destroyed. The upper lip and lower eyelid of the right eye are scarred. The health of this patient is not only uninjured by the arsenic, but is very materially improved. The same preparation was used as in the last case. This extraordinary case is well known to Professor J. H. Green, Dr. Blundell, and other medical men. The patient is still subject to occasional attacks of impetigo, and the skin of the nose is somewhat irritable, but it is gradually recovering as her health improves.

Case 17.—*Lupus Exedens.*—The disease in this case had existed six years. The arsenical course was commenced at Midsummer. By the following Christmas the nose was reported as "nearly well," and the health and appetite much improved. The right ala of the nose was nearly destroyed, and the bone had become painful. Fowler's solution was the preparation used in the usual doses. This lady resides in the north of England, and I have not heard of her lately.

had recourse to antiphlogistic treatment, but with such indifferent success that he was obliged to fall back again upon the empirical use of purgatives. Next, more than forty cases were treated by leeching the abdomen, and full opiates. The patients were relieved in a few hours, or at the farthest in two or three days, and he believed he had attained his object.

In other cases, however, the cure was very slow, and in others again not permanent, although purgatives succeeded to the narcotics. After further attempts he had recourse to *alum*, as recommended by Gendrin, and he was able in 1838 to report highly in its favour; and since that period he has constantly employed it, without accident or disappointment occurring. He prescribes from one and a half to two drachms in a ptisan, to be taken during the day, adding to this forty or fifty drops of laudanum, and if the bowels do not act by the third day, giving a mild aperient: and the case is complete. More than 150 patients have been thus treated with complete success, the alum being continued a day or two after the symptoms have disappeared. This treatment, realizing the *citò, tutò, and jucundè*, of Celsus, after so long a trial of others less efficacious, he now recommends as one not likely to be improved upon.—*Brit. and For. Medico-Chirurg. Review, Jan.* 1851, *p.* 45.

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## 149.—PROTECTION OF GRANULATING SURFACES.

By Professor Miller.

[Professor Miller protects raw granulating surfaces "from the influence of the atmosphere, by imitating the incrustation of nature." This he does by using "a thick semifluid aqueous solution of gum tragacanth." This is]

Laid gently and uniformly on the raw surface, so as completely to protect it; and if at any portion the envelope threaten to become imperfect, the attendant is directed to effect an immediate repair. The application is productive of no irritation; and, being translucent, permits a complete surveillance of the part. Atmospheric influence is completely excluded; and the raw surface would seem to be placed in circumstances somewhat analogous to its normal state, as if still invested by the integument. Should inflammation ensue, no harm has been done; on the contrary, action is likely to prove less intense than it otherwise would have been; the gum is loosened and washed away by the purulent secretion; and water-dressing may then be used, as in ordinary circumstances.—*Brit. and For. Medico-Chirurg. Review, Jan.* 1851, *p.* 89.

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## 150.—DISEASES OF, AND OPERATIONS ON, THE THYROID GLAND.

By M. Luigi Porta, Professor of Clinical Surgery, Pavia.

[Dr. Handfield Jones, the most recent writer on the minute anatomy of the thyroid gland, describes its structure as follows:]

"A thin slice of the thyroid, examined under a low power of the microscope, displays its condition very perfectly and readily. It is seen to be made up of closed vesicles, aggregated together in groups of various sizes by the fibrous expansions just described. The form of these vesicles is primarily spherical; but many, perhaps the majority, are more or less affected by mutual pressure, being triangular, elongated, ovoid, or oblong. They are all perfectly closed, the wall being formed by a homogeneous limitary membrane, which is easily traced all round, and can never be seen passing off into a neck, or blending with the envelope of an adjacent vesicle. Where a number of vesicles lie closely crowded together, the homogeneous envelopes are of course in contact, or separated only by the interjacent vascular plexus; but those forming the surface of a group are invested by a thin expansion of fibrous tissue derived from the general capsule. The diameter of the vesicles of the human thyroid I have found to range from 1-2000th of an inch to 1-85th; in the bullock, from 1-2000th of an inch to 1-48th, the greater number averaging about 1-60th of an inch in this animal as well as in the pig. . . . The vesicles are lined internally by an epithelial stratum, consisting usually of nuclei set together in a scanty basis substance, which is either feebly granular, or of a somewhat oily

aspect. The nuclei are at once recognized by the practised eye, as exactly resembling those of the true glands. Their nucleoli are not always visible, and vary very much in number—from one to four or five. The nuclei are, however, always vesicular, bounded by a strongly marked envelope, and have a mean diameter of 1-3000th of an inch. It has been observed by Mr. Simon, and I have occasionally had the opportunity of confirming the remark, that the nuclei, instead of remaining in their primitive condition, proceed to the further stage of cell-development; this he has noticed both in man and the lower animals."

[As to the composition of its fluid contents, it appears that about 28 or 29 per cent. of solid matter exists in the secretion, nearly the whole of which is albuminous, though not as ordinary albumen. A small quantity of gelatine has been found in that of the ox. but not in the human subject. Crystals of triple phosphate and oxalate of lime occur in the cavities; but no urea or lithic acid. nor, in fact, any special or organic compound can be detected.

In describing the post mortem appearances of the gland after inflammation, Dr. Handfield Jones remarks:]

"I have more than once found the veins issuing from the gland, and passing its inferior margin, implicated in the inflammation and full of pus, or obstructed by a clot. In one case the coagulum completely obliterated all the principal venous trunks; even the lymphatic vessels, in cases of thyroiditis, often appear inflamed, varicose, tinged with rosy lymph, or puriform matter, and with opaque parietes. The glands to which they pass are swollen, red, sanguineous, and buried in masses of plastic lymph. The ramifications of the thyroid nerves are interlaced on the surface of the injected capillary vessels."

[The medical and surgical modes of treatment of simple organic productions of the thyroid gland are next considered. Of the first we must first ascertain the cause, and, if possible, avoid or remove it. The second is to resolve the tumour. As a local application, the author prefers the protiodide of mercury. Four or five grains, with a scruple of lard, are rubbed in at each friction; or a saturated solution of iodide of potassium in water mixed with lard may be used. From ten to twenty of these frictions will be quite sufficient to judge of the effect of the application. The absorption by the cuticle is perfect. Professor Porta generally now gives the iodide of potassium, commencing with eight grains daily, and increasing the dose to a scruple, half a drachm, or even a drachm daily. It is to be preferred to the tincture of iodine. Speaking of the inhalation of the fumes of iodine from a bladder, he says.]

"After inhaling the vapour of iodine for one minute, not so much as a grain of the metal being lost, my urine has given forth the odour of iodine for four or five days. After a single dose taken into the stomach, every appearance is lost after five or six hours. When a large dose is given at once, from five grains to a drachm of the iodine, or fifty or sixty drops of the tincture, or when the medicine is continued for several days, the urine generally, after suspension of the remedy, continues to give a violet precipitate, with starch and nitric acid, from four or five to eight or ten days. The minimum duration is three or four hours; the maximum ten, and in some cases twelve days. But sometimes even a small dose of some grains of the iodide continues to show itself in the urine for several days. I have several times taken a single grain of iodide in one or two ounces of water, and in a quarter of an hour I could procure a copious violet deposit from the urine, which was the case for five or six hours, as if I had taken a large dose. By the endermic method, or by inunction, the iodine does not appear in the urine for fifteen or twenty hours, or until the next day, and sometimes is not found. Indeed, we never find a precipitate so copious and so deeply coloured, as when the remedy, even in small doses, is introduced into the stomach, or into the cavities of serous membranes. But its presence in the urine is for a longer period. By inhalation the passage to the urine is made more quickly, but the precipitate obtained from the urine is slight. We may say, then, that the passage from the skin to the urine is slower and more sparing, but the resolvent effect on the tumour is more prompt and decided, probably because the iodine remains longer in the body of the patient."

The author also made a number of experiments in order to determine if remedies applied by the natural channels were found in diseased parts of the body. He used soluble salts of various metals, as iodide of potassium, chloride of barium, sulphate of iron, acetate of lead, and tartrate of antimony, upon a series of patients affected with ascites, hydrocele, hygroma, wounds, fistulæ, abscesses, &c., administering the salts externally and internally, and then collecting the various fluids for analysis by Dr. de Cattanei, professor of chemistry in the University. The result was indisputable proof of the material presence of the remedy administered, in the diseased parts.

The result of the administration of iodine in the treatment of bronchocele, may be total resolution of the tumour, partial resolution, or absolute inutility. Of 100 cases thus treated by the author, in one half, the tumour remained totally or in part, and in some of the other cases, the good effect was but temporary. This may be partly owing to the habits of the patient, his profession, or residence being the same that led to the first increase of the gland. Thus, the resolvent treatment with the removal of the causes of the disease, is both useful and safe, but only effects a radical cure in a limited number of cases, and these the slightest.

[Extirpation of bronchocele has often been mistaken for mere enlargement of the gland or tumours upon it and external to it. Still eighteen or twenty cases are reported of it during the last century; the result in about half successful. Professor Porta has performed it four times, every time with a fatal result. The danger arises from the hemorrhage, denudation of vessels, and nerves of neck, or trachea and larynx, and diffusive suppuration; or from acute inflammation of the air apparatus; or from nervous exhaustion. The operation of extirpation of the whole, or part of the gland, should be discarded from surgical practice. Small isolated tumours may be easily and safely removed. Small accessory lobes, or isolated appendices, may increase and form tumours, the gland itself remaining normal. Professor Porta has repeatedly excised such tumours with perfect safety and success, a simple linear cicatrix remaining.]

*Method of the Author.*—Convinced of the difficulty and danger of isolating the thyroid gland from the part surrounding it, Professor Porta has followed a plan which he strongly recommends as safe and efficacious. But we must now let him speak for himself:

"In studying the thyroid gland, my attention has been directed to two facts which have especially interested me. First, that the arteries are inserted at the extremities of each lobe, and that their trunks run towards the superior, inferior, and external margins of the lobes; also that the large branches before penetrating the parenchyma, generally subdivide into a digitation of smaller branches. Thus, although the thyroids are *externally* four considerable arteries, *within* the tissue of the gland, they are merely branches and anastomoses of small calibre, and the embarrassment and danger of severe hemorrhage from injury to large vessels, are scarcely met with when we isolate the external portion of the tumour. In the second place, that the greater number of bronchoceles, as I have fully explained before, do not arise from degeneration of the proper glandular tissue, but from the generation of one or more non-malignant sarcomatous or encysted tumours in the midst of the parenchyma of the gland itself; that these tumours increasing, at last invade the whole space, and reduce the organ to a simple envelope or matrix, on dividing which the new products are exposed, and may be extracted with the greatest ease, injuring only small vessels, and leaving behind a fleshy sac, which, when so evacuated, falls together, and no trace of the tumour remains. . . . . The result of these observations was the following reflection:—if the extirpation of the thyroid gland, and even one lobe of it, is so difficult and dangerous, would it not be better to invert the plan of operation, and evacuate the contents of the tumour, without touching its external portion, without lacerating the surrounding cellular tissue, without injuring the arterial trunks, and without dividing the principal organs of the neck? On these grounds the new plan of operation consists in the simple incision of the external envelopes, and of the anterior surface of the tumour, at some distance from the direction of the arterial trunks;

in the evacuation of the tumour by means of separation and extraction, or by excision of the cysts and nodules contained in it, without separation of the outer surface."

We are not told in how many cases the author has performed his operation, but he has selected six as illustrations, stating that in these, and in all his other cases, it succeeded perfectly in removing the tumour, and curing the patient. In only two cases did inflammatory symptoms require prompt antiphologistic treatment. In one case a coriaceous cyst, and two sarcomatous tumours were removed from the substance of the gland. In another, the gland did not contain new products, but the enlargement was owing to simple hypertrophy. In this patient, the whole fleshy internal part of the tumour was cut away, leaving a sort of surrounding bark, about two lines in thickness. The bleeding was very slight. Cysts and sarcomatous tumours were extracted in all the other cases recorded.

The instruments for this operation are merely scalpels, blunt-hooks, dissection and torsion forceps, scissors, &c. There are three steps in the proceeding. First: division of the integuments of the neck and of the second belly of the omo-hyoid muscle, which is almost always necessary. Secondly: incision of the tumour parallel to the external incision, avoiding the branches of the thyroid arteries, or on division, at once applying the ligature or torsion, which is very easy, because the branches are mere secondary ones, running along and adhering for some distance to the surface of the tumour. Thirdly: by means of the forceps, and the back or handle of the knife, cysts or tumours are removed. When very deep and adherent, they are excised on the base. In case of simple hypertrophy, the whole internal texture of the gland may be removed. Should any arteries be injured in this last step of the operation, torsion should be employed.

Sometimes the wound heals by the first intention, but more frequently it suppurates, and cicatrizes in a few weeks. Occasionally it becomes sacculated, and requires dilatation, or becomes converted into a fistula, which does not close for a considerable time. The great object of after-treatment is to moderate inflammation which may arise, adopting active antiphlogistic measures, should its extension to the chest or head be threatened.

We think this operation well worthy of adoption by British surgeons. Not only is the plan a legitimate deduction from observation of the pathological anatomy of the thyroid gland, and the anatomical disposition of its vessels, but it is accompanied by abundant proof of its safety and success.—*Brit. and For. Medico-Chirurg. Review, Jan.*, 1851, *p.* 96.

## 151.—TREATMENT OF ITCH.

By MM. Bazin and Bourguignon.

M. Bazin, physician to the St. Louis, in a recent report furnishes an account of the trials he has made of the various means of treating the itch, and of the definite results he has arrived at. He states that at the time of his appointment in 1847, the medium time occupied in treating the disease by the *sulphuro-alkaline ointment* applied to the wrists and insteps, together with sulphureous baths and fumigations, was fourteen days; but that since he has caused the *entire body* to be well rubbed with it (rubbing with extra force those parts the acari specially infest), the patients are dismissed cured in two or three days. Some practitioners who have adopted the plan have erred in its application by leaving some portions of the body unrubbed, or by continuing the friction as long as any itching was perceived. In the first case the disease re-appears; while in the other, by prolonging the frictions beyond the time necessary to destroy the acari, and the vitality of their ova, other eruptions are induced which give rise to great itching. This itching and eruption, occurring after the employment of two complete frictions, furnish an indication to desist instead of to continue; and if they do not then disappear, they may be relieved by tepid baths.

There are cases, however, in which, from the existence of great abundance of pustules, the sulphuro-alkaline ointment would excite too much pain, or in

which the patients have such an invincible repugnance to its smell, that we should resort to some other substance; and M. Bazin finds, by numerous trials, that the *lard* and *oil*, which form the base of all antipsoric preparations, if employed in general frictions, either together or separate, will effect a cure, only from four to six, instead of two, frictions being required. Another ointment recently tried, containing *chamomile*, cures in three frictions, soothes the itching instantly, and does not give rise to any secondary eruption. It is composed of equal parts of fresh chamomile, olive oil, and lard.

M. Bourguignon, in his recent prize essay, prefers the *staphysagria* to any other remedy. He adds 300 parts to 500 lard, stirring the powder into the boiling lard, and keeping up a temperature of 100°, C. for twenty-four hours. After straining, a little essence may be added. Baths should be taken before and during the treatment, and the frictions should be made four times a-day, the cure being completed by the fourth day.—*L'Union Medicale*, 1850, Nos. 82, 135. *Journal de Chimie Med.*, No. xi. *p.* 671.—*Brit. and For. Medico-Chirurg. Review*, *Jan.*, 1851, *p.* 258.

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## 152.—ABORTIVE POWER OF COLLODION ON SMALL-POX.

A case has recently occurred in the wards of M. Aran, at the Bon Secours, in which the good effects of collodion was proved to be as decisive in confluent small-pox as it had been found before in the more simple form. It occurred in the person of an unvaccinated young man, and the collodion was applied to all parts of the face but the lips and ears. Through this transparent covering the progress of the postules was observed to become at once arrested, while those uncovered continued enlarging. Moreover, a part of the covering having been destroyed without being observed for some hours, the postules thus exposed immediately began to develope themselves until again arrested by a reapplication. The ears, too, were now covered, and the progress of the pustules stopped there. In a few days the collection peeled off, the skin looking as after erysipelas, but no cicatrices were to be observed, though in other parts of the body they existed in abundance, the eruption having been very confluent. —*Bul de Therap.*, vol. xxxix., p. 369.—*Brit. and For. Medico-Chirurg. Review*, *Jan.* 1851, *p.* 279.

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## 153.—IODOGNOSIS.

M. Dorvault has published a series of researches on the chemical, therapeutical, and medical properties of iodine. To these, as embracing the entire knowledge of all the properties of that substance, he has given the name of iodognosis.

We here submit an abstract of the medical portion of these researches, from the 'Gazette Médicale de Paris':—

Iodine, as a therapeutic agent, according to M. Dorvault, is unimportant; it is to its combination as *iodides* that its medical value is due. Even when introduced alone into the system its therapeutic effects are to be attributed to its combination with the alkalies which exist in the fluids of the body. Under either circumstances the terms *iodic medication* express the same fact. Iodide of potassium is taken by M. Dorvault as the type of iodides.

*Physiological Action of Iodides.*—Iodides belong to that class of therapeutic agents to which M. Dorvault gives the name of *chemico-catalytic*, and form its most striking representative. This proposition is founded on the following facts:—If the animal fluids (blood, lymph, semen, milk), or their proteic elements (albumen, fibrin, casein), be subjected to the action of a solution of iodide of potassium, it will be seen to prevent their coagulation and dissolve them. In producing this effect the salt remains unaltered; it acts, therefore, by virtue of what chemists have called the *catalytic* force. The same may be shown to have obtained when employed in certain pathological cases. The salt may be detected unaltered in the blood or urine, or other secretions.

These facts have been observed by many other investigators, and all have found practically that iodide of potassium promotes secretion, increases the functions of the mucous glands of the alimentary canal, and of the liver, *kidneys*, skin, pancreas, parotid, &c.

Iodide of potassium is rapidly eliminated from the animal fluids. Dr. Scharlau (of Stettin) found that a patient to whom he gave fifty-three grammes daily, eliminated fifty-one grains by his urine. The five grains lost were accounted for by the elimination of this salt by the saliva, sweat and tears. Dr. Kramer satisfied himself, from his experiments, that six days sufficed for the complete elimination of this salt after its exhibition during fifty days. The researches of Dr. Marchal, at Vâl de Grace, also prove the rapid passage of iodide of potassium by the urine.

Iodine introduced into the system has been separated by the action of alkalies on the blood.

*Special Action of Iodides.*—The accidental or consecutive action of iodides has often been mistaken for their primary or efficient action. Some physiologists have considered iodine as a stimulant, others as a contra-stimulant. M. Dorvault observes that neither view expresses the exact truth. He admits a certain degree of general constitutional excitement under its employment; also that in severe pains of the bones, and other tumours, the action of iodine is sedative by allaying pain. But in both these cases the stimulation and the sedative action are the consequence, not the cause, of the beneficial therapeutic agency for the remedy.

A third opinion, that iodine is alterative, M. Dorvault regards as nearer the true explanation, but as insufficient in fact, as the medicinal influence of the iodides is often seen after the first dose, therein differing from alteratives. M. Dorvault admits, however, the alterative action of some substances in which iodine exists in minute quantities,—*e. g.*, spong, cod-liver oil, &c.

M. Dorvault also considers the purely chemical theory of the action of iodine as incorrect; his own opinion being, that the medicinal virtue of the iodides consists in their power of dissolving or further liquefying the *humours* of animal bodies, of separating their constituent or proteic elements, and disposing these to the formation of new products, such as coagula, false membranes, and pathological concretions: that the iodine and the potassium united both concur in the production of this result, by a special and peculiar chemico-physiological power which iodides possess of liquefying the fibrin of the blood without destroying the globules; while potash, ammonia, and other substances, dissolve the blood in all its parts.

*Therapeutic Action of Iodine.—The pathological states in which it is employed.*—Goitre, scrofula, syphilis, skin diseases, white swelling, caries of the vertebræ, tabes mesenterica, rickets, phthisis, leucorrhœa, amenorrhœa and chlorosis, cancer, cachexies, dropsy, poisoning, tumours, rheumatism, various chronic diseases, hypertrophy. These are the forms of disease in which, M. Dorvault observes, the administration of iodine is indicated.—*Med. Gazette*, *Jan.* 10, 1851, *p.* 86.

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## 154.—CICATRIZATION OF AN ULCER PROMOTED BY THE ELECTRIC MOXA.

Under the care of Mr. Bransby Cooper.

[The attention of Mr. Cooper was formerly directed to this process for the promotion of the cicatrization of obstinate ulcers, by Dr. Hull, of the United States of America. Instead, however, of employing the galvanic battery which is cumbersome, he used one introduced by Dr. Golding Bird, merely using two plates, one of silver and the other of zinc, connected by a copper wire. The case in which the apparatus was used, was an ulcer originally produced from a gun-shot wound situated on the inner side of the right foot and below the ankle. The charge of shot passed obliquely through the soft part of the right instep, and injured the navicular bone. During the treatment several small pieces of bone came away, as often as two or three times a week. The wound never however, completely healed, and previous to the application of the electric moxa, it was the size of the hand.]

Carrot poultices were first used, and leeches were from time to time applied round the sore. Warm water dressing was subsequently employed, and the patient took sarsaparilla, but this treatment, continued for about six weeks, proved unavailing as regarded the cicatrization of the ulcer.

from one of the eyes being near its point, the whole of the instrument need not necessarily be passed through the wound. It may be used to evacuate abscesses, either by small openings or subcutaneously.

It has been all sufficient to introduce caustics, &c., (either solid or fluid) into tumours or cavities, where a syringe or more appropriate apparatus could not be procured. Any solid matter may be placed in the groove of the instrument, and covered with the canula until it arrives at the part where its application is desired, when the canula can be withdrawn. Of fluids, too, an all sufficient amount can generally be introduced by having the end of the canula made more funnel-shaped than usual: or thread or cotton may be saturated with a solution, and placed in the groove, and retained in its position by being passed through the eye near the point of the director, until it arrives at its required destination.

Lastly, I may add, I have found it of great service in the dissecting room, in the operation of "tying arteries" supplying all that is required, at least in the superficial vessels, after the first incision is made.

I would not wish it to be understood that I think so simple an instrument can supersede the use of the various contrivances that have been invented for the different purposes I have named: far from it, but merely to state that I have used it most satisfactorily, and so may others, when a more appropriate instrument could not be obtained: feeling certain that any portable, simple, instrument,—*a multum in parvo*,—must be of peculiar value to medical men situated in extensive and thinly populated districts, who, like myself perhaps, have met with a severe compound fracture fifteen miles from home, or had to ride a like distance to fetch a catheter.

A. B., aged thirty-five years, sprained his wrist six years since, which continued weak and occasionally very painful on motion, for about twelve months, at the expiration of which time he perceived a small swelling, about the size of a pea, on the radial side of the wrist. This gradually enlarged for two years, when it vacated the wrist, and made its appearance in the palm of the hand, where it remained for three years, gradually increasing in size, till it had assumed the dimensions and much the shape of a large filbert.

It occasions the patient considerable pain and inconvenience whilst at work, and often compels him to desist milking, which forms the principal part of his usual occupation.

About twelve months prior to the operation being performed, I was first consulted; I then assured the patient that by the swelling being pricked, it might readily and safely be cured. He, however, consulted another surgeon, who told him there was danger in the operation, and at once burst the cyst, and afterwards applied pressure: this, however, failed to effect a cure; and in a short time the swelling was as large and troublesome as it was previous to this proceeding.

The patient now being willing to submit to any operation I thought necessary, I introduced the lanceolate director from below upwards (as I felt the pulsation of an artery surrounding its superior margin,) first by pinching up a *piece* of the hardened skin of the palm about half an inch from the cyst, and pushed the point of the instrument through it, when it immediately entered the cyst, and part of the jelly-like contents of which immediately flowed out along the groove in the director, and a little external pressure soon emptied the sac by the same passage, leaving the director alone in the cavity; which was next required to well scarify the interior of the cyst. This, however, from the dense skin through which it was introduced pressing it firmly down against the palm and fingers, could not easily be accomplished by raising and depressing the end of the instrument in the usual way. The object, however, was easily attained by pressing with the finger over the cyst, and gently moving the director backwards and forwards, thereby making it scarify both the upper and lower walls of the cyst at the same time.

The director was then withdrawn, a piece of adhesive plaster placed over the wound, a bit of leather several times doubled to form a pad, to make pressure over the emptied cyst, and a few turns of a bandage to cover the whole, completed the operation.

The next day the puncture was found healed—in fact, the patient could not discover where it had been made; very little pain had been felt, but the cyst presented much the appearance it did previous to the operation, being again distended, apparently with fluid, and painful on firm pressure. The compress and bandage were again employed. On the third day it was reduced to about half the size; on the fifth, the walls were collapsed, and no prominence perceptible; on the seventh, it appeared quite cured, and was not the least painful on pressure; on the eighth, he returned to work, and has not since experienced any annoyance from it; but on pressure a slight induration can be felt where the cyst previously existed; this, however, is perfectly painless, and the man says the hand is much stronger than it ever had been since the first appearance of the swelling.

The above I believe to be the best mode of treating the majority of such cases. In numerous instances in which I have myself operated, and seen others operate in this way, it has been without a failure, or any disagreeable consequences; while, on the other hand, though perhaps more or less generally successful, I have known pressure, simple puncture, bursting, external stimulants, and injection with tincture of iodine, in some cases fail.

The operation has the advantage of being very simple, not generally painful, mostly applicable, very quickly affording relief, and, to say the least, in the majority of cases successful.—*Med. Times, Jan.* 11, 1851, *p.* 35.

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## 157.—GLANDULAR ENLARGEMENTS IN THE GROIN AND AXILLA OF YOUNG PERSONS; TREATMENT BY CAUSTIC POTASS.

In a paper on Issues and Caustics, published in the 'Dublin Quarterly Journal of Medical Science' for February, 1851, Dr. B. G. Darley refers to the form of constitutional or sympathetic enlargement of the glands of the groin, frequently met with in young men, and not the consequence of venereal virus, but rather the effect of a weakened and cachectic constitution. This tumour is very indolent in its nature; a long time elapsing before suppuration is established, and resolution is not a common termination. Dr. Darley treats these tumours by making a tolerably sized eschar with caustic potash in the early stage, and covering it with a small poultice. The tumour will be found to have disappeared when the eschar separates.

Allied to this is a tumour often met with in the axilla of young persons. A young man applies for advice, with the arm either in a sling or supported by the other hand, and the shoulder depressed and pushed forward, and there is much anxiety and suffering in his countenance. If this be treated in the common way, we have to wait long before it suppurates; and if it be opened, only a small quantity of thick pus escapes. The opening will soon close, and the abscess point in another direction, leaving sinuses which are tedious in healing. Dr. Darley treats such tumours by making a small eschar with caustic potash in the very beginning, when they are hard and indolent. They must not be mistaken for the acute abscess frequently met with in this situation, and easily treated by incision.—*London Journal of Medicine, April*, 1851, *p.* 376.

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## 158.—CASES OF TYPHUS AND AGUE TREATED BY DR. WARBURG'S FEVER DROPS.

[It appears that several physicians of the metropolitan hospital have for some weeks past been putting to test a tincture of Dr. Warburg. It is said to possess unfailing efficacy in various kinds of fever, especially intermittents. This tincture is being introduced to the notice of the public under the auspices of the profession, and Dr. Warburg himself is distributing gratuitously large quantities for the purpose of getting it fairly tested.]

The tincture has been for several years before the medical profession in various parts of the globe; and it would appear that it has maintained its ground in a very satisfactory manner, particularly for the rapid cure of intermittents, wherein it is stated to be superior to quinine. It is said to have like-

wise great control over typhoid fever, icterus, &c.; but its powers are most conspicuous in ague. In referring to a pamphlet by Sir Andrew Halliday, 'On the Sickness and Mortality in the West Indies,' published in 1839, we find passages bearing upon the fever drops, which will throw some light on the subject. Sir Andrew, after stating that the quinine had failed in Demerara, says, (p. 21:) "I was induced to have recourse to a remedy which had already become known in the colony, and was much talked of as Dr. Warburg's fever drops. . . . . These, the doctor assured me, were prepared from plants, the virtues of which he had ascertained during his sojournings with the native tribes. . . . . It was administered in about fifty of our worst cases, and under my own eye, with the most perfect success."

The medicine has since that time travelled far and wide; it was found very useful in our eastern possessions, and has been since introduced into the Austrian Pharmacopœia. We beg to present the following cases to our readers, in order that they may become acquainted with the usual effects of the remedy, and to facilitate any further inquiries they may wish to make. The value of the medicine must, however, be determined by a more extended series of facts than our limits will allow us to enter upon. We leave this task to the discoverer himself, and subjoin some cases from Guy's and St. Bartholomew's Hospitals.

Case 1. *Typhus.* (Notes by Mr. Eldrid.)—John E——, aged sixteen; ill seven days; was admitted into Job ward, Jan 22, 1851, under the care of Dr. Babington. He had all the symptoms of typhus, with profuse diarrhœa, and subsequently large evacuation of blood.

He was treated by astringents, wine, &c., for about a fortnight, the symptoms being a little improved by the treatment. Muttering was still going on, though the diarrhœa and evacuation of blood had ceased, when he was given Warburg's tincture—thirty minims every fourth hour.

Two days afterwards there was an evident change for the better—the tongue became more clean and moist, consciousness increased, and the bowels were opened but once a day; the patient passed good nights; the skin was moist; and there was decidedly less pain over the abdomen on deep pressure. On the ninth day after the use of the tincture had been begun he was fast convalescing, and was discharged a few days afterwards, having taken some carbonate of ammonia for a short time.

The tincture was tried in an inveterate case of chorea: it seemed to act beneficially for some days, but the improvement did not last. It was likewise tried in a girl with icterus, and seemed not to influence the disease.

Case 2. *Quotidian Ague.*—Margaret H——, aged forty years, a strong, swarthy looking Irishwoman, with black hair and eyes, was admitted into Lydia ward, March 26, 1851, under the care of Dr. Babington. The patient lives at Wapping, and is in very poor circumstances; she is married, has had seven children, and has been ill five weeks. Three weeks ago she was attacked with rigors, pains in the head and limbs, and a week afterwards the shivering fits occurred regularly every second day; for the last seven days she has had them every evening. The fits had first come on at about one o'clock in the day, but they had gradually appeared later, and on admission seized the patient at about five in the evening. The catamenia are regular: the bowels confined; there is pain over the region of the liver and spleen, headache, and cough; tongue coated and furred; pulse 89, compressible; urine dark. She was ordered a dose of aperient medicine, and to take the Warburgh tincture early the next morning; half the bottle to be given after breakfast, the other four hours afterwards. (The whole bottle contains about an ounce.) Before taking the tincture, on the next day, the patient had a violent fit, followed by the sweating stage. The medicine was regularly administered, and the following morning the fit was very slight.

From this period the patient remained quite free from ague, and is progressing very favourably.

(Notes by Mr. Langdon)—Johanna C——, aged thirty two, was admitted into St. Bartholomew's Hospital on February 6, 1851, under the care of Dr. Burrows. In the autumn of last year, whilst residing in Essex, she had an

attack of tertian ague, which lasted a fortnight, and readily yielded to treatment. She returned to town, and two months ago (a fortnight after her confinement) she was attacked with sharp pain on the right side, about the margin of the ribs. This lasted about eight days, but she had no medical advice, merely took aperient medicine with much relief. From that time the patient observed that her abdomen increased in size, and grew very large. About a fortnight ago attacks of shivering occurred daily at two o'clock, P.M., lasting about an hour, but not followed by the other stages of ague. She is a married Irishwoman, the mother of two children, and her only employment her domestic occupations. Her countenance and skin are natural; pulse 92, small and soft; tongue clean and flabby; appetite good; bowels constipated for two days. The abdomen is swollen, rather tense, and tolerant of pressure; there is a distinct sensation of fluctuation, and dulness on percussion in the most dependent part, changing with position. No tumour or enlarged viscus can be discovered. She was ordered the common purgative draught.

The patient was freely purged, and was ordered, on the second day, a drachm of Warburg's tincture, to be taken every third hour. The urine had been tested; it contained no albumen, was clear, but with some slight deposit of the phosphates by heat. On the third day it was found that the patient had perspired freely, and the urine gave no deposit by heat. The tincture was continued at the same intervals. On the fourth day the diaphoresis was still very copious; six doses had been taken on the previous day; the patient slept well, the alvine evacuations were relaxed, and the urine abundant. On the fifth day the perspiration was less profuse, the stools the same as before, the urine plentiful, and the fluctuation in the abdomen less distinct. On the sixth day it was ascertained that full four pints of urine were passed in the twenty-four hours; some griping was complained of; and as it continued on the following ing, the tincture was discontinued. The patient improved very rapidly in every respect, and was discharged on the nineteenth day after admission, the abdomen yielding no sensation or fluctuation, and the patient stating that it had returned to its natural size.—*Lancet*, *April* 19, 1851, *p.* 430.

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## 159.—NEW MODE OF ADMINISTERING COD-LIVER OIL.

M. Loze, a naval surgeon, stated that he had attributed the failure of this remedy in phthisis to its non-absorption; and that, with the view of effecting this, he had combined the oil with a mucilage containing pancreatic juice, which thus forms an artificial chyle. In this form the oil is readily and completely absorbed and its effect more directly obtained in phthisis.—*Med. Gazette*, *April*, 1851, *p.* 694.

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## 160.—PRACTICAL REMARKS UPON IPECACUANHA, WITH A FORMULA FOR THE SYRUP.

By Dr. Edward Jenner Coxe, New Orleans.

The value and efficacy of ipecacuanha, as an emetic or expectorant in many affections of the respiratory organs, more particularly of children, are too generally conceded and acted upon to require an extended notice.

In dysentery, ipecacuanha has been, and continues to be, much used. By Mosely, who held it in high repute, ipecacuhana was given in doses of half a drachm to two scruples; and by the late Professor B. S. Barton, it was regarded as almost a specific, particularly in cases of a typhoid character. In chronic diarrhœa, small doses of the powder, repeated several times a day, either alone, or preferably in conjunction with opium or Dover's powder, will be found of great value, and frequently, with strict attention to a proper regimen, will succeed in curing many most unpromising cases. In these last cases, when dependent upon, or connected with, derangement of the biliary secretion, additional power will be given to the above doses, by uniting with them two or three grains of blue mass, to be repeated every night for three or four nighe and subsequently, every third or fourth night, as long as may be deem·d requisite or advisable for the individual cases.

In hæmorrhage from the lungs or uterus, small doses of ipecacuanha, combined with sugar of lead and opium, are used with decided benefit. In hæmorrhage from the stomach, large doses of ipecacuanha have been strongly recommended, more particularly, by Dr. Condie, who has published some valuable practical remarks upon the subject.

In the early stages of the bowel affections of children, no less than in adults, an emetic of ipecacuanha will often succeed in arresting the progress of the disease, and rarely fail to prove beneficial.

By combining from one-fourth to half a grain of ipecacuanha, with a minute portion of opium, and two or three grains of blue mass, the alterative properties of this last are materially enhanced. This method will be found of great benefit in most of the mild cases of biliary and bowel derangement so prevalent in this region, at different seasons of the year.

With the exception of that sudden and often fatal disease, croup or hives, there are perhaps none of the pectoral diseases of children, in which the syrup of ipecacuanha may not be resorted to with advantage; but in croup, no little experience, and an almost uniform success in its treatment, authorize the confident belief, that we possess no one remedy, or combination of remedies, comparable or equal to the well-known Coxe's Hive Syrup, provided it be properly prepared. Dr. Good has remarked, that the ipecacuans concur in operating very generally upon the skin, at the same time that they excite the stomach, increasing, in a slight degree, the discharge of mucus from the lungs and adding a little to the peristaltic motion of the bowels, while the antimonials act more violently upon the stomach, bowels, and skin, but less upon the mucus secernments.

Finding the process for the syrup, recommended in the United States Dispensatory, attended with unnecessary trouble, and uncertain as to uniformity, I adopted, after many trials, the following formula:—℞. Ipecacuan. rad. contus. ℥ iv; aquæ Oij; sp. vin. rect. ℥ x; sacch. alb. lbs. iiij. Macerate the bruised ipecacuanha in one pint of boiling water for twelve hours, then add the remainder of the water and alcohol, and continue the maceration for five or six days. Place the whole in a small displacement apparatus, returning the fluid that passes until it becomes perfectly clear, and then continue to pour a small quantity of water occasionally upon the surface, until two pints and ten ounces by measure shall have passed. Now add the sugar, and with a gentle heat, evaporate until the syrup shall be of a proper consistence; readily ascertained by occasionally taking out a small portion and allowing it to cool. When of a proper consistence, pass it through a small quantity of fine tow placed in the tube of a funnel, to render the syrup clear and transparent. Three pints and ten ounces of syrup is the quantity obtained. It is, in strength, nearly double of that prepared by the usual formula; and this I consider an additional recommendation.—*Western Lancet.—London Journal of Medicine, Feb.* 1851, *p.* 178.

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## 161.—PROFESSOR METTAUER'S APERIENT SOLUTION.

Professor Mettauer, in an article on constipation, speaks in the highest terms of praise of the following "Aperient Solution:"—℞. Aloes soc. ℥ ijss; sod. super-carb. ℥ vj; aquæ Oiv: sp. lavand. co. ℥ ij. After digesting for fourteen days, the clear liquor may be either decanted or allowed to remain. Age improves both the power and taste of the solution. "I claim for myself," the professor says, "the sole credit of originality in the invention of this compound,"—a modest claim enough too, which we hope posterity will ratify. The aperient acts both on the liver and the muciparous glands; corrects and prevents acidity; and probably aids assimilation when oily articles are used as food. It should be given in about half an hour after dinner and supper, the common dose being ℥ j, though in some cases this may be increased even to ℥ j. A single dose is sometimes sufficient, and then should be given at bedtime, diluting the solution with water, if desired. It is suitable to almost every example of constipation complicated with defective biliary secretion, except when the state of the stomach is alkalescent; and may be used also in

the constipation of pregnancy. It has been found useful in constipation with hæmorrhoidal tumours about the verge of the anus, and especially so in that which accompanies all varieties of perverted menstruation; so much so, that its inventor regards it as a valuable emmenagogue wherever constipation is present, while fever and inflammation are absent.

In constipation connected with long-continued derangement of the biliary system, or what is sometimes called bilious dyspepsia, it is the most useful of aperients, with which nitro-muriatic acid in doses of a few drops before meals (the aperient being given after meals) may often usefully be associated. It has often been employed with great benefit in the constipation of hysteria and hypochondriasis, a "nervine incitant," as castor or valerian, being added to it in such cases. In the constipation of the convalescent stage of fever, when the patients have began to take solid food, it is of great value in preventing relapse, by regulating the functions of the bowels and promoting digestion. It requires in these cases to be cautiously given in small doses. For students of sedentary habits, "it is the very best remedy in the world for obviating the constipation so troublesome and health-destroying with them at that important and interesting period of their lives. If used regularly, their bowels will seldom or never become constipated; and the use of the remedy is not attended with inconvenience nor trouble, and never interferes in the smallest degree with study or diet." (In spite of the author's somewhat extravagant laudation we do not doubt this *is* an excellent aperient, and have therefore transcribed the formula.)—*Amer. Journal Med. Sc.*, N.S. No. 40, p. 380—*Brit. and For. Medico-Chirurg. Review*, *April*, 1851, *p.* 549.

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## 162.—THE BIBERON, A NEW FEEDING-BOTTLE.

We have seldom seen, says the editor of the Lancet, anything more beautiful or better adpted for its use than the Biberons, or feeding-bottles, for infants, invented by M. Darbo, of Paris, and introduced into this country by Mr. Elam, of Oxford-street. Though they are of recent invention, they have obtained great celebrity, and have come into general use in Paris. The nipple of the Biberon is made of cork, the superiority of which over Indian-rubber, or calves' teats, is at once apparent. It has not the repulsive taste or smell of the former, neither can it putrefy, as the latter always do. The cork nipple being hollow and elastic, the flow of milk is never interrupted; but calves' teats and India-rubber nipples becoming flattened by the pressure of the child's lips in sucking, the supply of milk is stopped—a very obvious disadvantage. The Biberon is so constructed, air being admitted through a delicate spiral tube, that the child cannot suck any air, which alone is a strong recommendation. The supply is regulated by a little ivory pin, which if inserted into the tube, and fixed in either of the divisions for that purpose, diminishes the quantity, but if taken away altogether, enables the child to feed as fast as may be desirable. Lastly, the Biberon is clean, compact, portable, and very easily kept in order.—*Lancet*, *Feb.* 15, 1851, *p.* 184.

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## 163.—AMMONIO ACETUS FERRI AND SYRUPUS FERRI ACETATIS.

[Mr. Alfred George Roper, in a letter to the editor of the Lancet, offers the following formula for the above preparations, and states their efficacy in cases where iron is required. The syrup, he says, is adapted for children, and they may be combined for adults.]

*Ammonio-Acetas Ferri.*—Dissolve one drachm of iron wire in half an ounce of hydrochloric acid, mixed with an equal quantity of water (by measure); then add half a gallon of water, and precipitate with five ounces of liquor potassæ; set aside for twenty-four hours; draw off the supernatant liquor with a syphon; fill again with water, and repeat the process a third time. Lastly, collect the precipitate on a linen filter; dissolve the oxide thus prepared in two ounces of strong acetic acid, and make up the measure to ten ounces with distilled water: set aside for twenty-four hours, and filter. To every twenty

ounces of the filtered liquor add half an ounce of liquor ammoniæ. Dose, ten minims to half a drachm.

*Syrupus Ferri Acetatis.*—Dissolve two pounds of sugar in ten ounces of water, in a water bath; to the syrup, whilst hot, add eleven ounces of the acetate of iron, prepared as above (without the ammonia); when cold filter through paper. Dose, twenty minims to one drachm.—*Lancet, Nov.* 30, 1850, *p.* 609.

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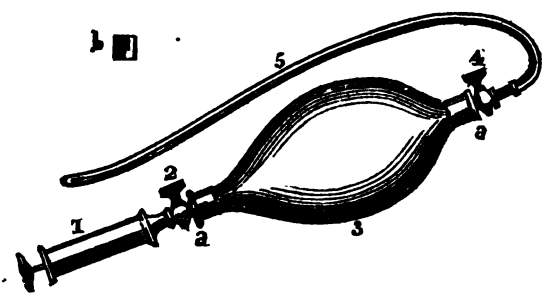
## 164.—ON A NEW STOMACH PUMP.

By Dr. Wilbraham Falconer, Bath.

[Dr. Falconer conceives that the stomach pump of the following description and form, may be advantageously used in lieu of those now employed.]

The apparatus consists of an exhausting syringe (1); an oval glass receiver (3), capable of containing from sixteen to twenty ounces of fluid; an india-rubber or gutta percha tube (5); together with two caps for either end of the receiver, similar to that represented at *b*. 2 and 4 are stop-cocks; *a a*, the extremities of the receiver, over which the caps are to be screwed when the exhausting syringe and tube, with the stop-cocks, have been removed.

When intended for use, the syringe and tube are screwed to the receiver, as represented in the sketch. The stop-cock nearer the tube is to be closed, while that nearer the syringe is to be opened. The receiver is then to be exhausted as much as possible by successive strokes of the syringe-piston, and when this is accomplished the syringe may, for convenience be separated from the stop-cock. The tube is then to be passed into the stomach, and the stop-cock attached to it being opened, the contents of the stomach will rapidly ascend into the receiver. When the fluid ceases to ascend, the tube is then to be withdrawn, and both it and the stop-cocks being removed, are to be replaced by the caps.




One disadvantage attaches to this apparatus—namely, that the stomach cannot be washed out by it. There are, however, advantages connected with it, which Dr. Falconer points out as rendering it worthy of attention. "It is an apparatus simple in construction and in its principle of working. No injury can arise from any error in the employment of it. Its adjustment occupies considerably less time then the ordinary stomach pumps. The contents of the stomach are removed much more quickly than by the ordinary apparatus, and they ascend into the receiver in one steady and continuous stream. The jerking action of the usual stomach pump is wholly avoided, and the danger of thus injuring the coats of the stomach evaded. The apparatus now proposed for use is infinitely much cleaner than any stomach pump now in use, inasmuch as the latter frequently, if not always, contain some, if not a large, amount of impurity collected around the piston and valves, the produce of their working, or decompositions resulting from the fluids brought into contact with them, and also by the too often filthy state in which they are left after use. So great, indeed," says Dr. Falconer, "as far as I have been able to ascertain, is the amount of impurities to be found in many stomach pumps in use, that

an advocate for the defence of a prisoner charged with an attempt, whether successful or not, to poison, might, I apprehend, very properly demand some information respecting the state of the instrument employed in removing the contents of the stomach, and urge that doubts as to the condition of those contents might be entertained by the court. The materials of which the apparatus now suggested for use in lieu of the ordinary stomach pumps is made ensures cleanliness, and the fluid removed from the stomach will have its integrity safely preserved. It flows direct from the stomach into the receiver, whence, by means of the caps, which can be properly secured by tape and sealing-wax, it can be transmitted to any distance for the purpose of analysis. I am disposed to regard that the analysis of even a small quantity of fluid thus removed from the stomach would be more satisfactory than a larger amount obtained by the usual means. I have endeavoured, and I trust fairly, to point out the advantages of the apparatus I have suggested. Should it prove useful, my object will be gained. I cannot, however, conclude without expressing my thanks to Messrs. Weiss for the care and attention they have paid to the manufacture of the apparatus, and to state that by them only is it made."—*Lancet*, *Jan.* 4, 1851, *p.* 16.

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## 165.—CASE OF SUCCESSFUL ADMINISTRATION OF KEY-TSE-SING, OR JAPANESE EMMENAGOGUE.

Communicated by Dr. E. Williams.

[The patient, Charlotte M——, was a stout girl, twenty years old. The catamenia appeared at the age of thirteen, but ceased about the age of sixteen, previously to which she had epileptic fits for three months. For three or four years previous to the administration of the remedy, she had had regular attacks of hæmoptysis or epistaxis every three or four weeks, though no sign of tubercle could be detected in the chest. Every means was tried to restore the discharge, but, says Dr. White, Physician to the County Hospital, Winchester, under whose care the case occurred,]

All having failed, after six months' time I resolved to make an experiment with the Key-tse-Sing. On Nov. 6th she commenced taking three drachms of this medicine, every six hours, in a little hot gin-and-water, and continued to do so for three days, when, not having experienced any effect from it, except some pain in the back, she omitted it for two days. I urged her to persevere with the medicine a little longer, and she re-commenced taking it every four hours. On the second day (Nov. 13th) the catamenia appeared, and flowed normally for three days.

She felt no inconvenience from the medicine, except some slight pain in the back.

*Remarks*—I will not occupy your pages by any lengthened remarks. I am justified in concluding from the above, and the numerous other reports I daily receive, as well as from cases in which I have had an opportunity of exhibiting it in my own practice, that this remedy will prove one of the most certain and valuable additions to our materia medica; and the only fear I have in its introduction is, that it may be abused, and become the too ready instrument of procuring abortion.—*Lancet*, *Jan.* 4, 1851, *p.* 10.

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## 166.—NEW PREPARATION OF IRON.

Dr. Routh exhibited to the Medical Society of London two specimens of phosphate of iron dissolved in metabasic phosphoric acid—one in a solid, the other in a fluid state. The compound was prepared by adding as much phosphate of iron as the metabasic phosphoric acid in a boiling state would take up, and allowing it to cool. The proportions would be found, as nearly as possible, two of acid to one of the phosphate. The solution obtained was of a semi-transparent greenish or slaty hue. If exposed to the air for a day, it hardened; but mixed with liquorice powder or flour, it could be made up at once into pills. The compound was soluble in any proportion of water, and free from any nauseous, inky taste. Dr. Routh had not analyzed it, and could

not assert whether it was simply a solution of the phosphate of the acid, or a new super-phosphate that was formed. He had given it largely. It appeared to him to be better adapted and more speedy in bringing about a cure, than any other preparations of iron, in some cases of anæmia and debility, brought on by venereal or other excesses, over-study, and other depressing diseases, in which there was a prevalence of nervous symptoms, and a large quantity of phosphates voided by the urine; *i. e.*, as the former might be considered to supply the amount of carbon necessary for combustion directly to the lungs, thereby checking the drain upon the system, and allowing it to rally from its hectic state: so he supposed the present remedy supplied directly to the brain the amount of phosphorous necessary, to the undue diminution of which the nervous disorder was probably due. The medicine did not gripe or constipate. He gave it in doses of one or two grains three times a day.

In answer to a question. Dr. Routh stated that he had obtained one specimen from Mr. Morson; but most of that he had employed had been prepared by Mr. Greenish, of New-street, Dorset-square.—*Lancet, Jan.* 25, 1851, *p.* 94.

## 167.—ADMINISTRATION OF IRON IN FOOD.

M. Martens has lately read an essay before the Belgian Academy of Medicine, on Ferruginous Medicines. Among his conclusions, as published in the 'Gazette Médicale de Paris' for 30th of November, we find the following:

"Wheaten bread may be rendered much more nutritive" for chlorotic patients, "by adding a small quantity of sulphate of iron. In this way alone, it can be capable of forming a substitute for meat."

In the discussion, it was suggested that the same method of medication would be beneficial to patients recovering from acute diseases, especially when the system was not yet able to bear an animal diet. This idea is good: and would be easy of application.—*London Journal of Medicine, Jan.* 1851, *p.* 68.

## 168.—FORMATION OF ARTIFICIAL MILK.

In the July number of the 'Bibliothek for Lœger,' Dr. Panum writes as follows:—It occurred to me that the question of the identity of the material I have been describing with casein, might be solved by the *synthetical* method, which, though it can seldom be satisfactorily employed in scientific diagnosis, yet in the inability of analytical chemistry with regard to the protein compounds, is not to be despised. If it were possible, by adding the necessary constituents, to form from the substance under consideration some universally known product containing casein, such as milk or cheese, we should have a striking proof of the identity of the substance with casein.

I obtained a quantity of serum from bullock's blood. To this I added acetic acid, in the proportion of six drops of concentrated acid to an ounce of serum, and then a considerable quantity of water. The substance described in my former contributions sank, on standing, to the bottom of the vessel, so that the superabundant clear fluid could be poured off. On again adding water and letting the substance sink to the bottom, it was rendered almost perfectly free from soluble albumen, etc. After it had settled as much as possible, the water was poured off, so as not to waste the substance, which remained suspended in a greater quantity of water than casein is diluted with in milk. It was now my object to find out, whether the solution of this substance produced by salts or an alkali could be brought to coagulate by contact with the mucous membrane of the stomach of kittens or puppies: and whether it were possible to produce a substance which, in taste and other circumstances, should agree with milk. But as it would probably be difficult to make animals use the solution as milk, unless the other constituents of milk, namely butter and sugar, were mixed with it, and as the taste and peculiarities of cheese might be modified by them, I first tried, by adding these substances to produce a liquid which should have some resemblance to milk. At a temperature of 30 Raumer, I added to the milky liquid phosphate of soda, till all the supposed casein was dissolved. I then added butter and sugar in the proportions in which they

are usually contained in milk, and, after the butter was melted, I shook the whole mixture in a flask. The liquid, at first greyish or dirty yellow, became of the colour of egg-flip, and, as it cooled, became more and more like milk. The clearer and the less mixed with red blood-corpuscles the serum was, the clearer was the solution and the whiter the milk-like fluid. If the serum was perfectly free from blood-corpuscles, the emulsion, when diluted with water, had the same bluish colour as milk and water: but if there was a strong blood-red tinge in the serum, the solution in phosphate of soda had a reddish and the emulsion a weak yellowish tint. The product had a taste which bore a most striking resemblance to that of true milk; only it was a little more sweet, and left a feeble, though recognisable, bitter, after-taste.

Under the microscope, I observed in the emulsion innumerable small globules exactly like those in milk. On comparing them with those found in milk, scarcely any difference could be perceived, except that their average size in the artificial milk was somewhat greater than in the natural. The globules in the artificial milk were surrounded by a covering, and not simple drops of oil; this covering often showed a distinct though very fine folding, especially on the larger globules. The globules (like those of true milk) were not dissolved in ether, until the covering had been removed by treating them with nitric acid. But by the side of these small globules there were some which were somewhat greater and presented in their interior appearances which, if they had been furnished from the organized body, would have been certainly considered as a nuclei, granular cell contents, etc. . . .

As the difficulties, which might have been expected to arise in the microscopic comparison of the artificial and the true milk, had so unexpectedly disappeared, I felt myself called upon to inquire whether any more perfect imitation could be attained. The most striking difference, which the artificial milk presented on a superficial examination, was that it required a far shorter time than real milk to form a layer of cream on the surface, and that, after standing some time longer, a layer of clear liquid was formed at the bottom of the vessel. I ascribed this failure to the greater average size of the globules in the emulsion, as compared with true milk globules. When I employed sugar of milk in place of common sugar, the emulsion was uniform, and showed no layer of clear liquid at the bottom of the vessel, even when more water was added. At the same time, the average size of the corpuscles became less, so that they could not be distinguished by their size from the true milk-globules, and they were now free from any appearance of nuclei or granular cell-contents. The cream was longer in rising to the surface: and the great sweetness which the emulsion had, when made with common sugar, was no longer prominent, so that the liquid tasted still more like milk. A slight smack of salt disappeared, when the butter was washed in water; and a slightly harsh taste of the butter was still farther removed when unsalted butter was used, which had been freshly churned, and washed with water. There was still a slightly bitter after-taste, but this was removed by using carbonate instead of phosphate of soda; a much smaller quantity of the former salt being required to produce the required solution. It was now impossible for me to recognise, by the taste, any difference between artificial and real milk. As, however, it might be said that "*de gustibus non est disputandum*," I submitted the liquid to the taste of others, with the same result. . . .

It now only remained, to render the agreement perfect between the artificial and true milk, that the former should coagulate when brought into contact with the mucous membrane of the stomach. When I used common sugar, it was not wonderful that my attempts thus to make the liquid coagulate, failed; for it is well known, that the addition of sugar to milk retards or prevents its coagulation. But, even after I had used sugar of milk, I could not perfectly succeed in making the milk coagulate. Instead of fresh calf's stomach I used the artificially prepared swine's stomach, which is commonly used in the dairies, with or without a temperature of 40 R.: and I also gave the liquid to two kittens, who drank it greedily, and whom I then killed. Under these circumstances, as well as by mere standing, the artificial milk turned, and separated into a clear liquid, and a thick curdy mass, which had very strongly the

well known smell of sour milk; but I could not produce a consistent coagulum, which could be collected in linen, and pressed out. But when the orginal substance separated from the serum, after being washed from soluble albumen, was warmed, it formed masses resembling pressed curds, and could be collected on a cloth, while the liquid ran through quite clear.

The identity of an artificial with natural milk, and of the substance found in the blood with casein, may seem to be not proved; yet the resemblance is so great as to strengthen the probability of their being identical. I have in vain endeavoured to produce from albumen, precipitated from albuminate of soda by acetic acid, and dissolved in phosphate or carbonate of soda, a liquid having the slightest resemblance in taste to milk.—*London Journal of Medicine, March*, 1851, *p.* 256.

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## 169.—CASES ILLUSTRATIVE OF THE POWER OF THE COLD DOUCHE IN PROMOTING AND ARRESTING ABSORPTION.

By Dr. C. F. Sloan, Ayr.

[Dr. Sloan remarks that the following cases of an encysted tumour,—a goitre and a scirrhous mamma,—are the only morbid growths which he has submitted to its action, and in all there has been decided improvement. The water with which he has practised is supplied to the town from a basin 100 feet above the lowest street. He applies it by means of the gutta percha tubing fixed to one of the pipes, allowing the stream to strike the object at from six inches to two feet from the end of the tube; at all events, before the column of water is broken. A pressure of less even than forty feet of water produces excellent effects. The application should be continued until a decided sense of pain is induced, or for something less than five minutes.]

Case 1.—The first case was one of encysted tumour in a male, aged 36, situated on the sacral origin of the left gluteus maximus, of such a size, that a mould taken by sheet gutta percha was capable of containing seven fluid drachms. It had existed ever since the patient could remember, was latterly increasing perceptibly, and from its situation gave considerable annoyance. The douching commenced on the 6th September, 1849, and continued daily for a minute or two till the 6th December of same year. At this date the tumour was reduced to about one fourth of its original size, a mould now taken being capable of containing only two fluid drachms, and the annoyance had almost disappeared. The improvement was most marked in the early part of the treatment, which was prolonged in the hope of a perfect cure. I have examined the tumour lately, and find that it still retains the last mentioned size, so far as can be determined by manual examination. Of course excision was the preferable plan here, but the trifling pain and confinement were objected to. This case is chiefly valuable as showing the power of the douche over a class of tumours not very amenable to other treatment than the knife.

Case 2.—The next case was a bronchocele of the description sometimes called hydrocele of the neck, occurring in an otherwise healthy girl, aged 20, and which had existed since childhood. This, after a long continued treatment by iodine and seton, still retained a size which caused considerable difficulty of breathing, and of which the mould could contain six fluid drachms. The first effect of the douche in this instance was to cause a rapid and general deposition of fat, the amount of which I was able more accurately to determine from the comparison of two casts of the neck, which were taken on the 25th September and 31st October, 1849, respectively. This did not arise from the discontinuance of the iodine, as she had taken none of that medicine for six months previously. The increase of the adipose tissue may tend to confirm one of the opinions entertained with regard to the use of the thyroid gland, and even to indicate an influence that the imperfect discharge of its functions may exercise in inducing cachectic disease. The douching was interrupted during winter, when the tumour remained stationary, and was resumed in spring. On the 29th June, 1850, the difficulty of breathing had ceased, and the mould then taken could contain only one fluid drachm. The treatment was continued, though irregularly, till 29th September last, when

the tumour was still further reduced, the mould being capable of containing only forty minims. As, in the first case, the treatment was prolonged in the hope of a perfect cure, but in this I was disappointed.

Case 3.—The last case was a scirrhous mamma, with retraction of the nipple and sanious discharge, in a female, aged 45, otherwise healthy, with all the functions regular, and the glands of the axilla unaffected. The tumour had been pronounced cancerous by a high authority in such cases; but excision was not thought advisable. It had been kept in check for three years by local and general means, chiefly leeching and periodide of mercury; but, in July last, she presented herself with the skin over the tumour becoming red and tuberculated. I recommended the douche, but took no cast, as I scarcely expected any improvement. I was agreeably surprised, however, by seeing the patient some weeks later with the tumour decidedly less, and the tuberculated appearance much diminished. The douching at first increased the sanious discharge, which afterwards diminished. The treatment has been continued ever since with occasional intervals of a fortnight. I had an opportunity of examining this case a few days ago, and found the skin, that had formerly been red, of a natural colour, and only one tubercle out of three or four remaining. I have no doubt that the douching, in this instance, has considerably retarded the stage of ulceration. The treatment was conducted by means of a syphon drawing its supply from a tub, elevated only a few feet.—*Monthly Journal of Med. Science, Dec.*, 1850, *p.* 501.

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## 170.—EXPERIMENTS ON ABSORPTION—INTRODUCTION OF INSOLUBLE SUBSTANCES INTO THE CIRCULATION.

By M. Bernard.

Substances that are capable of being absorbed may be divided into three classes:—1. Liquids or solutions. 2. Gaseous bodies. 3. Solids capable of minute division.

The last mode of absorption has been disputed; but M. Bernard states that he has shown this to be no less real than that of undissolved fatty matters.

M. Bernard has studied the subject of absorption in reference to the following points:—

What part do the nerves perform in this process? Is it entirely physical, and independent of nervous influences? Does the quantity of blood influence absorption? Does absorption take place in a bleeding animal with a rapidity proportioned to the loss of blood?

The stomach, when empty, absorbs freely; but when full, and in the act of secretion, it absorbs no longer. Absorption takes place generally where there are vessels, as in the lungs, the cellular tissue, the skin deprived of its epidermis; but, nevertheless, there are substances which are not equally absorbed in all parts of the body, which will cause death when introduced into the blood or tissues, but are inert when introduced into the alimentary canal. A living or a dead membrane is only capable of endosmosis up to a certain point; after saturation the process will cease. Does carbonic acid produce asphyxia by its own poisonous nature, or by the impediment offered to respiration? An elective or specific absorption has been attributed to the lacteals. M. Bernard points out that the phenomena are due to peculiarity of structure of the lymphatics and veins of each intestinal villus. MM. Magendie, Segalas, Sandras, Bouchardat and others, considered that certain substances pass from the intestines by the veins, and not by the lacteals. M. Bernard indicates an error, in their observations having been made on the contents of the portal vein and thoraic duct. If prussiate of potash be injected into the stomach, and the lacteals be examined as they pass from the intestines, the salt will be detected, and thence to the glands.

In order to illustrate the various modes of absorption, M. Bernard first treats of the absorption of poisons.

The poison of the viper is clearly not absorbed by the mucous membrane, or the animal would poison itself by the secretion of its venomous saliva. The same may be observed of the poison of rabies. A parallel fact is recorded by

Humboldt:—The South American Indians, in the neighbourhood of the Orinoco, have a poison (the *curare* or woorara poison), collected from plants of the Strychnos tribe, and with which they poison the weapons used in killing animals; and yet these animals feed with impunity upon the plants from which the poison is derived.

M. Bernard at first supposed that this fact was to be explained by attributing its separation from the blood in the liver; but having injected a portion of this poison into one of the veins of the portal system, the effects of poisoning speedily followed, showing that the immunity resulted from some influence exerted upon the poison in the alimentary canal.

M. Bernard introduced a portion of woorara through a fistulous opening into the stomach of a dog, and administered also a portion by the mouth without producing ill consequences. The gastric juice, under both circumstances, exerted a poisonous influence when inserted into the cellular tissue, rendering it evident that the woorara had not been destroyed by the chemical action of the gastric juice.

When injected into the rectum, or enclosed in a portion of intestine between two ligatures, the poison was absorbed without ill effects.

The analysis of the woorara, and of the poison of the viper, exhibits in each an insoluble substance, which M. Bernard regards as a ferment analogous to animal and vegetable distaste, or to pepsin.

M. Bernard gives the result of experiments made upon the action of *amygdaline* and *emulsine*—two substances which, separately, are inactive; but which, mixed together with water, form prussic acid poison of great potency. If administered to animals so as to combine in the course of the alimentary canal, no injurious effect ensued; but if made to meet in the cellular tissue, or in the course of the circulation, the phenomena of poisoning are immediately manifested, the odour of prussic acid being perceptible in the dead body.

The same occurs if the *amygdaline* be introduced into the digestive tube, and the emulsine into the blood; because the former is dissolved and absorbed; but the emulsine containing the insoluble ferment is not absorbed, and the poisonous effect does not follow if the latter be in contact with the mucous membrane.

Investigations into the phenomena of *endosmosis* reveal curious analogies with reference to the non-absorption of certain substances by mucous membranes. If an endosmometer, formed of animal membrane, be plunged into a solution of woorara, the water passes, and not the poison. If the experiment be tried on a solution of *emulsine*, the water will pass, while the *emulsine* remains. The diastase of a germinating seed is in the same predicament, because vegetable membranes possess similar properties. If a bean be placed in gastric juice or a solution of pepsine, it will become swollen by imbibition, and be capable of germination so long as its surface is unbroken. In this manner seeds taken into the digestive organs may retain their germinating powers, and be conveyed to great distances. But if the slightest fissure exist on its surface, the pepsine or diastase will enter its structure, and it will be digested. In a similar manner amygdaline and emulsine exist distinctly side by side in the bitter almond so long as its structure is entire: they are separated only by a thin membrane.

M. Bernard alludes to the absorption of vermillion and of Prussian blue from tattooed marks in the skin, and the detection of these substances in the neighbouring glands by M. Follin. M. Sterlin, he adds, has also detected abundant particles of charcoal in the lungs of animals to which that substance had been largely administered. These facts, M. Bernard considers, establish the absorption of insoluble substances by the lymphatics. The explanation of their manner of absorption is still wanting. Microscopical anatomy does not detect orifices in the villi of mucous membranes.

The explanation of these apparent cases of elective power of absorption in mucous membranes is simply a want of absorption: it is only the soluble portion which cannot be absorbed, while the insoluble portion is absorbed; thus reversing the doctrine—*corpora non agunt nisi sint soluta*. All substances not capable of absorption belong to the class of [illegible]

M. Bernard mentions some facts from inorganic nature analogous to the preceding—*e. g.*, if a solution of acetate of copper be poured upon a filter of animal charcoal, the acetic acid will pass through, and the copper remain in the charcoal. In retention of urine the water is absorbed, while the urea becomes concentrated. The same is observed with reference to bile, which becomes inspissated on retention.

M. Bernard gives a new explanation of the phenomena of the rapid appearance of certain fluids in the urine after their ingestion into the stomach. He has discovered that liquids, after having traversed the vena portæ and the liver, and having arrived in the vena cava inferior, descend again by that vein to the renal veins; that there exists a valve in the interior of the vena cava, at the point of the orifices of the renal veins, which hinders the passage of the blood in the iliac veins, and the fluid is obliged to pass by the renal veins, which thus for the time perform the office of arteries. This phenomenon occurs only when a large quantity of liquid has been drunk. The mechanism exists in all animals which take a large quantity of food of a slightly nutritious quality. If only a small quantity of fluid be taken, the circulation proceeds uninterruptedly towards the heart.

The lumbar and azygos veins form a collateral circulation by which the obstruction of the iliac veins is obviated. The communication of the portal circulation in the liver with that of the vena cava favours the rapidity of the passage of that fluid, and forms a diversion for the relief of the heart against so sudden an increase in the quantity of the blood.

M. Bernard further points out the muscularity of the vena cava from the hepatic to the renal veins. This portion he regards as a true heart, which acts temporarily under the circumstances above indicated, while the valves before named prevent a flow of blood beyond the renal veins. The quantity of blood thus diverted passes by urinary secretion. M. Bernard remarks also that this arrangement of the circulation may explain the rapid disappearance of certain poisons in some animals. It may be regarded as the representation of the circulation in reptiles, where the blood of the lower parts of the body passes through the kidneys.—*L'Union Medicale.—Med. Gazette, Nov.* 22, 1850, *p.* 908.

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## 171.—DIVISIBILITY OF MATTER.

Many years ago a curious calculation was made by Dr. Thomson, to show to what degree matter could be divided and be still sensible to the eye. He dissolved a grain of *nitrate of lead* in 500,000 grains of water, and passed through the solution a current of sulphurated hydrogen, when the whole liquid became sensibly discoloured. Now a grain of water may be regarded as about equal to a drop of that liquid, and a drop may be easily spread out so as to cover a square inch of surface. But, under an ordinary microscope, the millioneth of a square inch may be distinguished by the eye. The water, therefore, could be divided into 500,000,000,000 parts. But the lead in a grain of nitrate of lead weighs, 0·62 grains; an atom of lead cannot weigh more than 1-310,000,000,000th of a grain; while the atom of sulphur, which is combined with the lead, rendered it visible (in the mass?), could not weigh more than 1-2,015,000,000—that is, the two billioneth part of a grain.

But what is a billion, or, rather, what conception can we form of such a quantity? We may say that a billion is a million of millions, and can easily represent it thus—1000,000,000,000. But a schoolboy's calculation will show how entirely the mind is incapable of conceiving such numbers. If a person were able to count at the rate of 200 in a minute, and to work without intermission twelve hours in the day, he would take to count a billion 6,944,944 days, or 19,025 years 319 days. But this may be nothing to the division of matter. There are living creatures so minute, that a hundred millions of them may be comprehended in the space of a cubic inch. But these creatures, until they are lost to the sense of sight, aided by the most powerful instruments, are seen to possess organs fitting for collecting their food, and even capturing their prey. They are therefore supplied with organs, and these organs con-

sist of tissues nourished by circulating fluids, which circulating fluids must consist of parts or atoms, if we please so to term them. In reckoning the size of such atoms we must speak not of billions, but perchance of billions of billions. And what is a billion of billions? The number is a quadrillion, and can be easily represented thus—1,000,000,000,000,000,000,000,000; and the same schoolboy's calculation may be employed to show, that to count a quadrillion, at the rate of 200 a minute, would require all the inhabitants of the globe, supposing them to be a thousand millions, to count incessantly for 19,025,875 years, or for more than 3,000 times the period for which the human race has been supposed to be in existence.—*Low's Inquiry into the Simple Bodies of Chemistry.—Med. Gazette, Dec.* 6, 1850, *p.* 972.

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## 172.—ON SOME OF THE CAUSES OF PERICARDITIS, ESPECIALLY ACUTE RHEUMATISM, AND BRIGHT'S DISEASE OF THE KIDNEYS.

### WITH INCIDENTAL OBSERVATIONS ON THE FREQUENCY, AND ON SOME OF THE CAUSES OF VARIOUS OTHER INTERNAL INFLAMMATIONS.

By Dr. John Taylor, Professor of Clinical Medicine in University College, and Physician to University College Hospital.

[The principal object of the author, in this communication, has been to determine what are the principal causes of pericarditis, and ascertain their frequency, both absolutely and relatively to each other.

The reader will find in 'Retrospect,' part 20, p. 63, some account of Dr. Taylor's views of the treatment of pericarditis by mercury, but we had not room in that volume to give further information of this gentleman's views. We, therefore now do so, because we consider them very interesting and of much consequence.

The author does not profess to investigate *all* the causes of pericarditis. He has *first* inquired what were the causes *actually observed* in all the examples of the disease which have fallen under his notice; and, in the *next place*, he has investigated, more in detail, their *frequency*, both absolutely, and relatively to each other, as well as *some other of the circumstances* connected with each of the causes so observed.

*Lastly*, he has examined, incidentally, the influence of the same causes in producing inflammation of other internal organs, both in connexion with, and independently of pericarditis.

The cases of acute and severe pericarditis examined are thirty-five in number. Of these—

19 occurred in the progress of acute rheumatism.
10 " connexion with Bright's disease of the kidneys.
3 others may have had Bright's disease; but if not the cause is unknown.
1 occurred with malformation of the heart and consequent cyanosis.
2 were produced by the extension of inflammation from a neighbouring texture, in 1 from the liver and diaphragm, and in one from the *left* pleura.

Total ... 35

These *severe* cases of pericarditis may again be conveniently subdivided into two smaller groups.

1st. Those occurring in persons previously in good health or in the course of an acute disease; and 2nd. Those occurring in persons in bad health or in the progress of some chronic disease. A *remarkable* and *important* difference will be found in these two divisions, in relation to the causes of the disease.

Of twenty-nine cases examined, with a view to this difference, sixteen belong to the *first*, and thirteen to the *second*, of the two divisions just described.

Of the cases in the first class *all* were complicated with acute rheumatism, and *none of them*, so far as is known, with Bright's disease. Of the cases in the second class only one was complicated with acute rheumatism; whereas fully

two-thirds *known* to be associated with Bright's disease, and *all* of them *may* have been.

The *two* great causes of the pericarditis, therefore, appear to have been acute rheumatism, and Bright's disease of the kidneys. The author next enters into some considerations intended to show that these two diseases owe their power of inducing pericarditis to the *same* ultimate cause. viz., an alteration in the composition of the blood; but he does not attempt to determine, whether the alteration in the blood be essentially the same, in relation to the production of pericarditis, in the two diseases referred to. If it be assumed that the pericarditis, which was associated with cyanosis, likewise depended upon the state of the blood in that disease, it will then appear that only two *generic* causes of the inflammation of the heart were observed in the thirty-five cases under consideration, viz., a morbid condition of the blood, and extension of inflammation from a neighbouring texture.

The author next examines the cases of adhesion of the pericardium, and of white spots upon it, with reference to the causes of the inflammation producing them; and he arrives at the conclusion, that in every case in which any information is given upon the subject, there had previously been either acute rheumatism, or pleurisy, or there was found actually existing, either Bright's disease, or some other disease of the kidneys.

The two chief causes of acute pericarditis which were thus observed, viz., acute rheumatism, and Bright's disease of the kidneys, are next examined with more detail.

I.—*Of Acute Rheumatism as a Cause of Inflammation in the Heart.*—The *frequency* of acute rheumatism, as an observed cause of pericarditis, has been already stated; it was observed in two-thirds of all the cases of the latter disease.

The complementary inquiry, *i. e.*, into the frequency of inflammation of the heart, in cases of acute rheumatism, remains now to be made.

Of seventy-five cases of acute rheumatism, treated by the author in University College Hospital, thirty-seven, or about one half had morbus cordis of some kind or degree, the rest had probably none.

Among these seventy-five cases of rheumatism, there occurred six of acute pericarditis of considerable severity, besides two very slight cases. The proportion of the former, therefore, was one in twelve and a half cases.

In the same seventy-five cases of rheumatism, there were thirty-two cases of valvular disease of the heart, either old or recent, besides two known to be recent. There was, therefore, one case of valvular disease in about every two cases of rheumatism.

The author next compares these results with those of various writers upon the same subject, and from this comparison he concludes—

1. That acute inflammation of the heart has occurred less frequently, as a complication of acute rheumatism, in his experience, than it has been believed to occur in the experience of those writers whose opinions seem to have been most generally adopted by the profession.

2. That the frequency of inflammation of the heart, even in his cases, has been such as abundantly to shew the great influence of acute rheumatism in its production.

An attempt is next made to ascertain the real amount and the causes of the difference between the observations of the author and those of the writers referred to. The result, as it respects most of these writers, may be briefly stated to be,

1st. *Of Pericarditis.* In those instances in which such data have been given as enable us to compare *similar* cases, the results are very nearly the same. In various instances, however, no comparison can be fairly made, either from the want of *figures*, from the mixing together of cases of endocarditis and of pericarditis, or from a great difference in the age of the subjects.

2d. With respect to *Endocarditis*, the discrepancy is much greater than in the case of pericarditis, and one of the chief causes of the difference appears to the author to be, that most writers have given the proportion of cases of valvular disease in acute rheumatism in such a manner as implies (when it is

not *directly* stated) that they were *all* cases of acute disease—omitting, therefore, to distinguish the proportion of them which were of older date.

The proportion of cases of valvular disease of all dates observed by the author is nearly the same as that observed by the chief writers referred to; but he attempts to shew,

1st. That the *greater* number of these are examples of *old* valvular disease.*

2d. That, at all events, in most cases it is very difficult to distinguish when the disease is recent and when old, and,

3d. That, as far as he has been able to ascertain, acute endocarditis is less frequent than acute pericarditis in rheumatism.

The frequency of morbus cordis in chronic rheumatism is now inquired into and compared with that in acute rheumatism; and from this inquiry it appears,

1st. That the total number of cases of morbus cordis, old and recent, is nearly the same in the two kinds of rheumatism.

2d. That *acute* inflammation of the pericardium and of the endocardium is much more common in cases of acute than of chronic rheumatism.

That *frequency* of other internal inflammations in the course of acute rheumatism is next examined and compared with that of inflammation of the heart, and the result is that the last mentioned inflammation exceeds every other in the *frequency* of its occurrence.

The next subject of examination is—*the circumstances which favour* the occurrence of inflammation of the heart in the progress of acute rheumatism.

1st. *Metastasis.*—Metastasis of the rheumatism did not occur in any one of the cases observed; hence it is inferred that this is not the ordinary nor even a frequent mode in which rheumatism produces cardiac inflammation. It does not however follow from these facts that metastasis never takes place, and it is attempted to be shown that its occasional occurrence is both consistent with theory and established by observation.

In this part of the paper the author refers—

1. To some cases of rheumatism in which the inflammation of the heart appeared before that of the joints (p. 518).

2. To some cases of what has been termed "rheumatic fever without arthritis," *i. e.*, cases presenting all the symptoms of acute rheumatism except the affection of the articulations (p. 519.)

3. To one of his own cases in which he thinks that there may have been acute rheumatism, and in which there *was* pericarditis, but no affections of the joints throughout.

2d. *Form of the Rheumatism.*—Adopting the divisions of rheumatism given in the treatise of Dr. Macleod, we find that all the cases of rheumatic pericarditis occurred in connection with the *fibrous* as distinguished from the *capsular* form of rheumatism. In estimating the influence of this circumstance, however, it is necessary to remember that the fibrous variety of rheumatism is much more common than capsular.

3d. *Intensity of the Rheumatism.*—From the cases examined it appears to result that the violence and fatality of rheumatic pericarditis are generally greater in the cases in which the accompanying rheumatism is *very* acute than in those in which it is sub-acute.

Whether pericarditis be more *frequent* in the more severe than in the less severe form of rheumatism, the author's cases do not enable him with confidence to determine. *As far as they go*, however, they are opposed to such a view, for three-fourths of the examples of rheumatic pericaditis occurred in sub-acute rheumatism.

4th. *Stage of the Rheumatism.*—In more than half the cases of rheumatic pericarditis, the affection of the heart appeared on or before the fourth day of the disease. With one exception the pericaditis did not appear sooner in those cases in which it was very severe than in those in which it was much less severe.

* In this discussion the condition of the heart is referred to in 1026 cases of all kinds of disease indiscriminately, to shew the *proportion* in which the heart suffered.—*See Note, p. 494, Med. Chirurg. Trans.*

5th. *Influence of Repeated Attacks of Rheumatism.*—In the cases examined, pericarditis was found to be both more frequent and more severe in the first than in the subsequent attacks of rheumatism.

6th. *Previous Disease of the Heart.*—Ten out of fifteen patients had no previous disease of the heart, and among these were found all the most severe cases of pericarditis.

7th. *Age.*—Of fifteen patients, *nine*, or about two-thirds, were only twenty years of age or under; *five* were between twenty and twenty-six; and *one* was above forty.

8th. *Sex.*—Of fifteen patients, nine were males and six were females. It is necessary, however, to remember, that rheumatism is more common among men than women.

9th. *Influence of Venesection.*—Twelve of the patients had not been bled before the pericarditis appeared, the remaining three were bled, *one* eleven days, *one five* days, and *one three* days, before the pericarditis supervened.

*Mode in which Rheumatism produces Pericarditis.*—Upon this question the author adopts the following *hypothesis* as consistent with all the facts he is acquainted with:

The cause of acute rheumatism is probably the presence of some morbid matter in the blood, which has an especial affinity for the fibrous and fibro-serous tissues of the body, and which, by fixing itself in one or more of these, induces various local inflammations. The similarity of the structures implicated is probably the reason why rheumatic pericarditis or endocarditis often occurs at the same time with or succeeds to rheumatic inflammation in the joints, just as rheumatic inflammation in *one* joint occurs with or succeeds to that in another; and the heart is more frequently (?) and more *severely* affected in *severe* cases of acute rheumatism, for the same reason that more joints are affected and more severely affected, and also that more fever is present in such cases: which reason may not improbably be a greater abundance of the materies morbi in the blood.

II.—*Of Bright's Disease of the Kidneys as a Cause of Inflammation in the Heart.*—We have already seen that of thirty-five cases of pericarditis, Bright's disease was the only assignable cause of the inflammation in thirteen, or more than one third.

It now remains for us to institute the corresponding and complementary inquiry, into the frequency of pericarditis and endocarditis in Bright's disease.

1. In the bodies of fifty patients, who had either died of Bright's disease, or who were ascertained to have this disease in an advanced stage,

Acute pericarditis was found in 5 or in 1 out of 10,
and acute endocarditis " 4 " 1 " 12.

2. On the other hand in 142 bodies, in which the kidneys were not affected with any appreciable disease,

Acute pericarditis was found in 4 or in 1 out of 35,
and acute endocarditis " 2 " 1 " 71.

Pericarditis and endocarditis, therefore, being four times more frequent in fatal cases of Bright's disease, than in fatal cases without renal disease it seems clearly to follow that the influence of Bright's disease in producing these inflammations is *unquestionable* and great.

III.—The frequency of other internal inflammations in fatal cases of renal disease, is next examined and compared with their frequency in fatal cases without renal disease. From this comparison it appears,

1. That the proportional number of acute internal inflammations, exclusive of those of the heart, is *twice* as great in the series of cases with renal disease, as in that without such disease; the numbers being respectively ninety-six and forty-two per cent.

2. That the proportion of *patients*, likewise, among whom these inflammations were distributed, is greater in the former than in the latter series of cases; the numbers being respectively sixty and thirty-six per cent.

Hence, we may safely infer that Bright's disease has a great tendency to produce other internal inflammations besides those of the heart.

IV.—A further examination of the same facts, shews that the relative fre-

quency of various internal inflammations, is different in fatal cases of Bright's disease and of other diseases, taken indiscriminately.

The following are the various inflammations inquired into, arranged in the order of their frequency, as they were calculated to be due to renal disease, or to the causes operating in other fatal diseases.

1. *Inflammations due to renal disease.* Cerebritis, pnumonia, pleuritis, pericarditis, endocarditis, meningitis, peritonitis.

2. *Inflammations independent of renal disease.* Pleuritis, pneumonia, peritonitis, meningitis, cerebritis, pericarditis, endocarditis.

V.—From a comparison of the numbers given in this paper, we may calculate the tendency to produce various internal imflammations of the causes operating in fatal cases of Bright's disease, as compared with those present in cases without renal disease.

If we use the term Bright's disease, to represent all the causes operating in fatal cases of Bright's disease, and then compare these with the causes in operation in *fatal* cases without any renal disease, we shall find that Bright's disease produces:—

1. *Endocarditis*, almost 5 times as often as all other causes put together.
2. *Cerebritis*, fully 3½ " " " "
3. *Pericarditis*, fully 2½ " " " "
4. *Pneumonia*, just " " " "
5. *Pleuritis*, just ¾ " " " "
6. *Meningitis*, 3 times less frequently than " " "
7. *Peritonitis*, 100 " " " " "

The author next enquires into the *comparative efficacy* of acute rheumatism and of Bright's disease, in producing pericarditis and other internal inflammations.

In comparing these two affections, we meet with some difficulty arising from the fact that, *one* of them is an acute disease, and is seldom fatal, whereas the other is chronic and generally fatal.

It appears to the author that the best way of avoiding this difficulty is, by comparing *fatal* cases of Bright's disease with ordinary cases of acute rheumatism.

If the object were to ascertain the proportion of cases, in which traces of previously existing inflammation were found, this method would be objectionable, because the one disease having run a much longer course than the other, it would have had much more time to produce any inflammation which it had the power to produce; but if cases of *actually* existing inflammation alone be counted, then the objection does not exist and the result should not be far from the truth.

Of seventy-five cases of acute rheumatism, eight were complicated with pericarditis acuta, or one in nine and a half.

Of fifty fatal cases of Bright's disease, five were complicated with pericarditis acuta, or one in ten.

Hence, Bright's disease in the advanced stage, and acute rheumatism appear to have caused acute pericarditis in equal proportion of cases.

An examination of twenty cases of *old* adhesion of the pericardium, however, shews, what the considerations stated above might have led us to anticipate, that *old* adhesions of the pericardium have been produced twice as often by Bright's disease, as by previous attacks of acute rheumatism.

From considerations which could not readily be made intelligible in this abstract, the inference is next drawn, that acute rheumatism has a greater tendency to pericarditis than has Bright's disease in its *earlier* stages, and consequently that the tendency of Bright's disease to induce pericarditis and probably also other internal inflammations *increases* in proportion as the affection of the kidney is more advanced.

The conclusion thus arrived at is quite in accordance with the *modus operandi* of Bright's disease, in producing local inflammations which has been assumed in an earlier part of the paper; for, if this effect of renal disease depend upon a morbid condition of the blood, arising from the excessive accumulation of urea, we should expect the effect to increase in proportion as the structure and the

functions of the kidneys, and the consequent composition of the blood deviate more from the healthy condition.

In conclusion some remarks are made upon the probable occurrence of pericarditis in *other blood diseases*, besides those observed by the author. (p. 566.)

Likewise some observations on the importance of the constitutional or predisposing causes of inflammatian, as distinguished from the exciting causes. —*Medico-Chirurg. Transactions, Vol.* 28, *p.* 453.

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## 173.—DISCOVERY OF THE MAGNETIC PROPERTIES OF OXYGEN GAS.

At the last monthly meeting of the Royal Institution, Mr. Faraday announced to the members present his discovery (the subject of a paper sent in to the Royal Society) that oxygen is magnetic, that this property of the gas is effected by heat, and he believes the diurnal variation of the magnetic needle to be due to the action of solar heat on this newly discovered characteristic of oxygen—the important constituent of the atmosphere.

We do not mean to give the above as the terms of Faraday's announcement, or as the exact facts of the conclusions drawn from his last experimental researches, but only as a foreshadowing of the new results and views of one of our most eminent British philosophers. We must add, however, that Becquerel also has recently directed attention to a somewhat similar conclusion; he communicated to the Academy of Sciences at Paris, that oxygen is magnetic in relation to the other gases, as iron is to the rest of the metals, and inferred that it is probable or possible (we have not the paper by us to refer to) that the diurnal variation may be connected with this property of oxygen.—*Med. Gazette, Nov.* 29, *p.* 953.

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## 174.—FISTULA AND HÆMORRHOIDS TREATED BY THE PLATINUM WIRE MADE RED HOT BY A GALVANIC BATTERY.

**(Under the care of Mr. Marshall, University College Hospital.)**

Electro-magnetism and the purely electric shock have for some time past rendered great services in certain nervous diseases; surgical complaints seem now in a fair way of likewise deriving benefit from the galvanic force. A little time ago, we stated that a very obstinate ulcer at Guy's Hospital had been brought to cicatrization by an electric moxa. 'Lancet,' Jan. 25, 1851, p. 90. We now have to put upon record an ingenious application of galvanism, devised by Mr. Marshall, for the cure of fistula and hæmorrhoids.

The peculiarity of the method rests principally upon the faculty of the red hot platinum wire to divide the textures as surely as a bistoury, and to do this without causing any, or but a very trifling, hæmorrhage. In fistula in ano, for instance, it is found that the charred surfaces throw off the eschar in a few days; that the healing process, without the aid of lint, commences at the fundus of the wounds, and that the whole tract soon closes up. We were somewhat anxious to witness this application of the galvanic force, and having on the 29th of March seen three operations illustrating the same, we beg to subjoin a short description of them.

The first patient brought into the theatre was a man about thirty, who had been suffering for some time from fistula in ano. Various means had been resorted to in order to promote the healing of the tract, but to no purpose. Mr. Marshall therefore determined to lay open the intestine and fistula in the following manner:—A battery of six strong cast-iron cells, with zinc plates and copper connexions, was disposed close to the operating table; and the conductors (somewhat *thick* copper rods, to avoid the loss of galvanic force) were rendered flexible for about five or six inches, by an elastic tube filled with mercury. The pole held by the operator's right hand was in immediate connexion with the battery, but on the left side the current could be completed or interrupted by the intervention of a capsule filled with mercury. The extremities of the poles, slightly covered with mercury, were then connected with short holders, to which a platinum wire could easily be fixed, and when the assistant dipped

the left pole into the mercury, the wire was seen almost immediately to become red hot.

Now the great advantage of using the galvanic force in this manner is, that the wire may be disposed upon the affected parts whilst *cold*; it is easily adapted by being flexible, and when it is so placed as to answer the operator's purpose, the circuit is completed, and the effect produced in the direction which the surgeon gives to the wire.

The patient having been put under the influence of chloroform, Mr. Marshall introduced one end of the platinum wire into the fistulous tract, and made it reappear at the anus; the two ends were then connected with the poles, the circuit completed, the wire became red hot, and was gently brought downwards, dividing all the interposed tissues, and cauterizing them at the same time so effectually as to prevent any amount of hemorrhage. The only dressing used was a piece of lint dipped in cold water applied externally.

Mr. Marshall has found from previous cases, both in private and hospital practice, that the whole tract heals very rapidly from the bottom after the casting off of the eschar, which separation generally takes place in a few days.

The second patient was affected with external hæmorrhoids, connected both with the verge of the anus and with the lower portion of the mucous membrane of the rectum, the protruding mass being as large as a pigeon's egg. Chloroform having been administered, the hæmorrhoidal tumours were drawn out by a peculiar kind of forceps, and the heated wire slowly drawn across the pedicle of the mass. This was repeated for different portions of the growths, and where a little oozing of blood took place, the wire was made to cauterize the part slightly, which measure at once stopped the flow of blood. Mr. Marshall stated that it was important that the wire should act rather slowly, as a rapid section was likely to allow of a little hemorrhage. The time taken to sever a tumour did not, however, as far as we could judge, exceed forty seconds.

The forceps to which we just alluded were constructed according to Mr. Marshall's directions; they differ from the usual instrument in having a ring about an inch in diameter at the end of each branch; when the forceps are closed, the rings are superposed, and gain a very firm hold of the part to be secured. Mr. Marshall prefers these forceps to the vulsellum.

The third patient was affected in the same manner as the last, the extruding mass of hæmorrhoids being, however, somewhat larger and more congested. The operation was conducted precisely in the same manner as in the second case; here, however, either from the congestion being great, or the division a little too sudden, the hæmorrhage required the tying of a vessel, which latter was so large that the cautery applied to it could not control the bleeding.

Mr. Marshall took occasion to remark to the pupils that these were tentative operations, and that further trials would be necessary to ascertain in what cases this peculiar mode of simultaneous excision and cauterization was to be used. It was certainly the neatest and most elegant manner of using the actual cautery that had yet been devised.

He was inclined to think that the chance of hæmorrhage would be much lessened if the wire were somewhat thicker than the one he had just used. Mr. Marshall fixed such a wire to the conductors, and when the circuit was completed, it became red hot, but in a little longer time than the other had taken. Mr. Marshall thought that the method just described would eventually be peculiarly applicable to fibrous tumours of the uterus, and stated that he is having a battery constructed, where the cells would be managed in such a manner as to be quite ready for use by being dipped into the diluted acid; that the apparatus might then be put entirely out of the patient's sight by being placed under a seat or sofa, and that nothing but the conductors need be seen.

Mr. Marshall, subsequently to the operations, placed a dog under the influence of chloroform, and slowly divided the tongue half across with the platinum wire, without causing any hæmorrhage. This experiment went far to show that the thicker wire which was used in this instance would hold out a reasonable chance of dividing and cauterising without any loss of blood. We should mention that Mr. Marshall first used the galvanic force in the manner

above described, in a very obstinate case of fistulous opening in the cheek of a young man, which had refused to cicatrize under every imaginable kind of treatment. As the tract was about one inch and three-quarters long, and somewhat sinuous, a wire heated in the usual manner must get almost cold before it reached the whole extent of the tract; this objection was, however, entirely removed by the use of a wire introduced cold, and then heated by the galvanic battery. The success obtained in this latter case, which had almost been despaired of, was the first step in the series of cases which Mr. Marshall has since treated with very favourable results. We subjoin the results of the above-described operations:—

Case 1.—*Fistula in ano.* The sloughs began to separate on the second day; on the fourth, the wound was quite clean, the granulations large and the edges already rounded, and beginning to cicatrize. Until the sloughs separated there was some dragging and aching pain which, however, was not at all to be compared to the suffering after the division of fistula by the knife an operation which the patient himself had previously undergone. On the second and third nights, an anodyne was given, owing to some restlessness, but the draught was not repeated afterwards. A little tenderness was noticed in the groin on the third day, but this passed off after a few hours. In other respects, the patient made a steady recovery; in three weeks, the bottom of the wound only remained un-cicatrized, and now the fistulous tract is quite healed up.

Case 2.—*Hæmorrhoids.* The affection was here of twelve years' standing; the patient had had a great deal of pain and inflammation, as well as attacks of hæmorrhage. The final separation of the sloughs took place in passing a motion on the sixth day, accompanied with a severe but transient pain, and a slight oozing of blood. After this, he was quite easy. On the eighth day the patient sat up, and on the tenth, he resumed his work as a saddler, at home.

Case 3.—*Hæmorrhoids.* This case was of fifteen years' standing: and the patient had frequently suffered from severe inflammation, and had great losses of blood. He had aching pain at intervals for five days after the operation, as well as some tenderness in the groins. A portion of loose integument not removed in the operation, also swelled and became tender. The patient had severe fits of flatulence, which were generally very painful, lasted about a quarter of an hour, and then disappeared suddenly. On the third day he evacuated some clots of blood from the bowel; on the fifth, a fœtid mass of small size came away, and he was afterwards free from all pain, except in the swollen piece of loose skin, but in two or three days the pain subsided, and on the sixteenth day he went out to work as a painter.—*Lancet*, *May* 17, 1851, *p.* 546.

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## 175.—NATURE AND TREATMENT OF ARSENICAL POISONING.

By William Odling, Esq., F.C.S.

[In a paper read before Guy's Hospital Physical Society, Mr. Odling states it as his opinion that the only plan of treatment to be depended upon is the removal of the poison physically from the stomach, and that this is best effected by using the double-action stomach pump. He next considers the remedies to be used in cases of arsenical poisoning, and first, of the hydrated ferric oxide, or sesquioxide of iron. This, by being administered in the state of a moist magma, suspends the poison, but its power is extremely weak, and the compound formed with it is perfectly soluble in the gastric juice, and has been found to possess poisonous properties. Magnesia, so much vaunted at one time, is even less fitted to act as a chemical antidote.]

Numerous other chemical antidotes have been proposed, but they have not proved of sufficient interest or importance to warrant any further allusion being made to them. And now I wish to direct your attention to a few experiments which were performed with the following objects:—Firstly, I was desirous of discovering some compound containing arsenic, from the chemical relations of which an inocuous character might be deduced,—a condition which subsequent experiment should confirm; and, secondly, to ascertain some means by which powdered arsenious acid in the stomach might be con-

verted into this inocuous compound. After some consideration, I arrived at certain conclusions founded on the well-known chemical analogies between arsenic and phosphoric acids. The sesqui-arseniates of iron and alumina have been but partially examined; they have been found to correspond in their reactions with the corresponding phosphates; they are perfectly soluble in hydrochloric acid, but not at all so in acetic acid, unless it be very concentrated, and then only to an inconsiderable degree; and, as far as my experiments went, the sesqui-arseniate of chrome appeared to act in a similar manner. Therefore, from their chemical relations, I expected that these sesqui-arseniates would prove, if not entirely harmless, at least much less dangerous than ordinary white arsenic, when administered either with an excess of the sesqui-oxide, upon which the action of the gastric juice might be expended rather than upon the arseniate, or with an alkaline acetate, which, by reacting upon the gastric secretion, would set free acetic acid, in which these sesqui-arseniates are insoluble: and I tried the following experiments:—

Some sesquiarseniate of iron was prepared by adding to a solution of neutral arseniate of potassa a solution of neutral sesquichloride of iron, until no further precipitation took place, and the liquid contained an excess of iron. The whole was thrown on a filter washed with cold water until the washings came away pure: the precipitate, which was nearly white in colour, was dried at a temperature under 212° F. Of this powder five grains were taken, and mixed with ten grains of recently-precipitated sesquioxide of iron that had been dried in a water-bath, the whole rubbed up with a little water and mucilage, and administered to a full-grown rabbit. The animal was carefully watched for a fortnight, during which time no ill effects were observed. Specimens of the fæces passed during several days succeeding the administration of the arsenic, were examined for that substance by Marsh's test, and in every instance abundant evidence of its presence afforded. In another experiment, some arseniate of ferric oxide was made by adding a solution of arseniate of potassa to a mixture of the solutions of sesquichloride of iron and acetate of ammonia. A brownish white precipitate was produced, which was well washed until nothing further came away. It was then dried in a water-bath. Ten grains of this powder were taken and mixed with ten grains of sesquioxide of iron (recently precipitated, washed and dried at 212° F.), and five grains of crystallized acetate of potassa: the whole administered to a dog: no vomiting nor purging, nor any recognizable effect on the dog's health, was produced. The fæces he passed during the several days succeeding the administration of the arsenic were black in colour, normal in consistence and odour. Several different specimens were taken and examined by Marsh's test. Arsenic was found in all the portions tested. The presence of iron was also abundantly evident. In another experiment sixteen grains of the same sesquiarseniate of iron were mixed with four grains of dried hydrated ferric oxide, and four grains of acetate of potassa; the whole made into a bolus, and administered to a dog two hours after a meal: no recognizable effects were produced; the dog did not vomit, was not purged, had no abdominal tenderness. The dose was given at 10 o'clock A.M. During the ensuing night he passed a motion in which the presence of arsenic was proved. The next day's fæces contained arsenic in abundance: in the third day's excrement it was likewise present, but in the fourth day's could not be detected. The animal matter of the fæces was destroyed in the manner recommended by Fresenius and Von Babo, and the clear solutions tested by Marsh's process. In other experiments which I shall presently detail, arseniate of alumina was administered to dogs without any poisonous effects following. Therefore I conclude, that if in the stomach we could convert the arsenious acid into one of these sesquiarseniates, we should render it, if not entirely, yet comparatively, innocuous. Now arsenious acid is readily converted by most oxydising agents into arsenic acid, which, in the presence of the above-mentioned basis, forms the insoluble sesquiarseniates. As oxydizing agents—manganic, permanganic, ferric, and chromic acids, were employed; also the oxychlorides of calcium and sodium (hypochlorites), and mixtures of hydrochloric acid with chlorate of potassa. Numerous experiments were made. all showing more or less favorably, that arsenious acid could

readily, under divers circumstances and temperatures, be converted into arsenic acid. But the substances I at last fixed upon as being most suitable for my purpose, were, the chromate of iron or of alumina, and a mixture of permanganate of potassa solution with hydrate and acetate of ferric oxide, or with hydrate and acetate of alumina; giving the preference, however, to the last-mentioned combination; the effects of which I shall now briefly describe.

The permanganate of potassa I use is the crystallized permanent salt, made after Gregory's process having the formula—$KO,M_{II}^{2}O^{7}$. The aluminous salt is made by precipitating the hydrated alumina from the chloride, by ammonia, well washing and draining in a filter. The magma left is formed into an emulsion by agitating with a concentrated solution of the aluminous acetate. The aluminous is preferred to the iron compound, in consequence of its gelatinous condition being particularly suitable for suspending the arsenic. When the permanganate of potassa solution is mixed with the aluminous compound, slow decomposition takes place: so that it is better to keep the substances separately, and to mix them when required for use. When a solution of permanganate of potassa, if ever so diluted, is added to an acid neutral, or alkaline solution of arsenious acid, the colour of the permanganate is at once destroyed, and the arsenious becomes converted into arsenic acid. The reaction also takes place, though more slowly, when powdered arsenious acid is employed. When the antidotal mixture is added to solutions containing arsenious acid, the whole of the poison is converted into the insoluble sesqui-arseniate of alumina; and if it be agitated with powdered arsenious acid, the pulverulent molecules become converted externally into the sesqui-arseniate, and any solution of the poison effectually prevented. Every equivalent of permanganate of potassa is capable of converting two equivalents of arsenious into arsenic acid, which, calculated upon the atomic weights, gives us four parts of the permanganate to five of arsenious acid, nearly.

I will now briefly proceed to examine this antidote after the manner indicated by Orfila. According to this chemist, the first property that an antidote should possess is "that it should be taken in large doses without danger." Now the permanganate of potassa is undoubtedly an irritant, and possibly a corrosive; but, when administered in a dilute condition, no ill effects follow its ingestion. I took a mixture of ten grains of permanganate of potassa, dissolved in a quarter of an ounce of water, mixed it with a fluid ounce of the aluminous emulsion, and made the whole up to two fluid ounces, and then administered it to a dog at ten o'clock one morning. At four P.M. he had a relaxed motion, in which manganese was detected; but neither before nor after the motion did he appear to suffer any inconvenience. Now in administering the antidote by the stomach-pump to a human being, this quantity of the permanganate might easily be mixed with half a pint of the aluminous emulsion, under which circumstances its irritant action would be very trifling—not more than that of an ordinary sulphate of zinc emetic. The second property of an antidote is, "that it should act upon the poison, whether liquid or solid, at a temperature equal to or below that of the human stomach."

I have before explained that this antidote is not administered with the view of acting upon solid arsenic; but its complete action upon liquid, and incomplete action upon solid arsenic, take place readily at temperatures considerably below that of the stomach. The third property is, "that its action should be rapid." The action of the antidote upon solid arsenic is gradual,—upon liquid arsenic (for which alone it is intended), immediate. The fourth property is, "that it should be capable of combining with the poison, although enveloped in mucus, blood, or other substances contained in the stomach." It is probable that the antidote would act in spite of these conditions; but, if administered with the objects above pointed out, its action would be unnecessary, if the poison were so enveloped as to be incapable of solution or absorption. The last property is, "that it should entirely destroy the deleterious properties of the poison." That the result of the action of the antidote upon arsenious acid is a comparatively innocuous compound I think has been proved; but, with the view of still further strengthening this poison, I performed the following experiment upon two separate occasions:—I took twenty grains of powdered arseni-

ous acid, mixed it with a portion of the antidote containing ten grains of permanganate of potassa, well agitated and gently warmed the mixture, then threw the whole on a filter. The filtrate was of a bright red colour, not containing a trace of arsenic: the precipitate was mixed with milk, and administered to a dog. In the first instance no ill effects were observed after a lapse of five hours from its exhibition. During the night the dog vomited. The matters ejected and his fæces were accidentally thrown away, and consequently not examined. During the ensuing day the dog appeared lively and well, nor did he manifest any uneasiness. In the second instance the precipitate was mixed with milk, and exhibited to a dog three hours after a meal: he was carefully watched. Four hours after its administration he vomited, and again in about an hour after that. The matters vomited contained arsenic. Neither before or after the vomiting did he appear uneasy; he was playful, active, and eat everything set before him: the fæces he passed the next day contained arsenic. These experiments were not so conclusive as they were intended to have been, owing to the occurrence of vomiting, so readily excited in dogs; but they must be looked upon favourably as far as they go: the dogs recovering in both instances is something more than a coincidence.

In conclusion, then, it is evident that the external conversion of the pulverulent molecules or arsenious acid into the sesqui-arseniates of iron, alumina, or chrome respectively, and the precipitation of arsenical solutions in the form of these compounds, affords a rational expectation of effecting as much benefit as can possibly accrue from the use of chemical antidotes, and that this conversion can be produced by a mixture of the permanganate of potassa with the acetate and hydrate of alumina, or with the acetate and hydrate of ferric oxide, though doubtless more appropriate means of affecting this action are to be discovered; the action of the chromates of alumina and ferric oxide being particularly worthy of consideration.

And finally, that this antidote, though not by any means to be relied upon as a specific for arsenical poisoning, appears to act more efficaciously than any other which has hitherto been proposed. The subject is not brought forward so much with the view of enforcing the advantages of these antidotes, as of directing attention to a further investigation of the matter.—*Med. Gazette, May* 2, 1851, *p.* 756.

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## 176.—FATTY DEGENERATION OF THE PLACENTA.

By Dr. Robert Barnes, London.

[Two cases are related by the author, of premature labour occurring at the seventh month. In both the placenta was studded with fatty masses, apparently isolated by the surrounding structures. These appeared to be the result of fatty deposit or degeneration in the proper placental structure. In one case, branches of the umbilical vessels in an atrophied condition were traced through several of the fatty masses. From Dr. Hassall's microscopical examinations, it was proved that the placental villi, chorion, and umbilical capillaries, were all more or less altered and studded with minute spherules of oil. In some parts the process had extended to complete disintegration of the original structure; and in those parts appearing healthy, evidences of fatty deposit and degeneration being in progress were observed. The occurrence, however, of a certain proportion of oil in sound placentæ had been previously determined as a normal constituent.]

With the exception of a case of fatty degeneration of the placenta, recorded by Professor Kilian, and of which an abstract appeared in the 'British and Foreign Medico-Chirurgical Review,' for January, 1851, no distinct recognition of the nature of the affection is to be met with. The author regards the fact of the occurrence of this change of structure in the placenta as highly interesting both to the pathologist and to the obstetric practitioner. It promises to throw light on the disputed question of hereditary transmission of predisposition to this disease. It shows how rapidly such change of living structures may take place. The conversion of portions of placenta into solid unyielding structure, and the consequent imperfect attachment of these portions, and of

the surrounding healthy structure, to the womb, give rise to hemorrhage, and premature labour may occur possibly during the life of the child. A more frequent occurrence probably is the destruction of the fœtus in consequence of imperfect nutrition, and by a process of slow asphyxia. Fatty degeneration may also cause abortion in the early periods, the ovum being affected. With reference to treatment, it was suggested whether the known disposition to this destructive change, if established by the observation of preceding pregnancies, might not warrant the induction of premature labour, with the view of anticipating the period at which the fœtus would almost certainly be destroyed if left in the womb. Some suggestions were also offered with reference to the general treatment to be adopted with a view of counteracting the disposition to fatty degeneration before and during pregnancy.

[Dr. Quain remarked that the author had mentioned fatty deposition and fatty degeneration synonomously, but these were processes entirely distinct in their nature and effects.]

The deposition of fat from the blood led to the formation of adipose tissue; fatty degeneration, on the other hand, was a result of the disintegration of albumen and fibrin, and of the tissues into the formation of which they entered. There was here no adipose tissue, but a mere aggregation of granular particles. This disintegration may be witnessed in the formation of adipocire, or it may be made to occur experimentally in dead flesh, and the changes could be then followed by the microscope. It may likewise be observed in various albuminous, fibrinous, and other products in the living body, but beyond the sphere of vascular action, and also in various tissues and textures, the nutrition of which had been modified by inflammation, obstruction to the blood-vessels, &c.

[Dr. C. J. B. Williams said that the whole topic of fatty degeneration was one of growing importance, not only as constituting a serious lesion in itself, but also as forming a remarkable element in several other morbid processes, and in cachectic states. Fatty degeneration was not an independent and original vital process, like that causing hypertrophy, or malignant disease, instead of being, as it truly is, a chemical transmutation of fibrinous and albuminous deposits or textures, consequent on a failure of that degree of the nutritive process necessary to maintain a higher order of structure.]

One of the earliest observers who had set this matter in its true light was his friend Mr. Gulliver, who, in his paper on the 'Atheroma of Arteries,' published in the Society's 'Transactions,' and subsequently in his editions of Gerber and Hewson, had made known many examples of fatty degeneration of deposits and textures, and had suggested the probability that the change is chiefly chemical. About the same time, he (Dr. Williams) had compared this fatty transmutation in the living body to the conversion of dead flesh into adipocire; and he had cited numerous instances, in which the products of inflammation and obstructed natural tissues undergo more or less of a similar change during life. The researches of his friend Dr. Quain seemed to him (Dr. Williams) to have completely established this view, and to have further traced many of the modes in which impeded nutrition promoted the degradation of the natural tissues into molecular fat. It seemed to him (Dr. Williams), therefore, that it might now be received as a general law, that whenever tissues or deposits are imperfectly supplied with blood, yet sufficiently nourished to keep them from becoming dry or decomposed, there will be found the process of fatty transformation, more or less resembling the same change which takes place out of the body. Thus, imperfectly-organized lymph in the pleura, pericardium, or peritonæum; lymph in the texture of the lung or of cellular membrane; fibrinous clots in vessels; blood-clots in the brain; soft, recent enlargements of complex organs, as of the liver, kidneys, testicle; crude tuberculous masses, and torpid growths; non-malignant and malignant, had been repeatedly found by him (Dr. Williams) to afford, under the microscope, the clearest evidence of falling under this law. This law is, in fact, a most satisfactory clue to much that has been hitherto obscure in pathology, and unravels much of the mystery of the processes of softening of tissues, maturation of abscesses and tubercles, the breaking down of consolidated masses in spongy

organs, and the weakening and wasting of muscular and glandular structures. But this view would teach us to look beyond the mere fatty degeneration itself to the impaired or obstructed circulation, and sometimes altered condition of blood, which was its cause.

[Dr. Barnes remarked that he had not been convinced of the necessity for the distinction which Dr. Quain had drawn between fatty deposition and degeneration. As he (Dr. Barnes) understood the term, and as he had observed the affection, he was led to believe that deposition and degeneration were different stages of the same affection.]—*Lancet*, *May* 24, 1851, *p.* 574.

## 177.—TREATMENT OF CASES OF SYPHILITIC LEPRA.

By Dr. R. B. Todd, F.R S.

[We must first eliminate or endeavour to neutralize the poison upon which the disease depends, indeed, these indications may be fulfilled together, the first by promoting the excretion of poisonous matter from the system, and the second by the administration of such remedies as may deprive the poison of its virulence. As an antidote we may give mercury and iodide of potassium; as eliminatives, we pay attention to the general health, promoting the excretions from all the emunctories by means not tending to weaken. Five grains of blue pill may be taken night and morning, so as to affect the system slowly and gradually; and the mercurial influence is aided by giving iodide of potassium, which also seems to exercise some specific influence of its own.]

With reference to the administration of both these drugs I have this remark to make, that our rule should be, *festina lente*. It is when too much is thrown into the system, with a desire to produce a rapid effect, that certain accidents and untoward events are apt to arise. Hyper-salivation, violent iodism, irritation of the bowels, of the skin, peculiar nervous affections (erethism), are caused by the too free and too rapid introduction of these powerful poisons into the blood. It is also very advisable in many instances to withhold for a time the administration of one or both of these remedies, renewing them as occasion may suggest. And on administering mercury, it is often much more desirable to introduce it by the skin than by the stomach.

The cure of syphilitic lepra is a slow process, and therefore, when you take in hand a patient labouring under this disease, take care to prepare him beforehand for the tardiness of the process. A patient cured of syphilitic lepra within three months will have no cause to complain, but much more frequently a longer time than that is necessary.

And you will expedite matters if, at the same time you administer antidotes, you promote elimination by good diet, the occasional use of the warm bath, from time to time the use of aperients, &c.

Exactly the same principles of treatment are applicable to lepra and psoriasis. You will find as antidotes, arsenic, iodine, mercury, tar, and perhaps also alkaline remedies, as the liquor potassæ; and for the purposes of elimination we may purge or sweat, or use diuretics, or cause the patient to bathe.

Of all the antidotes I prefer tar, because I am quite sure that if it does no good it will do no harm. I cannot say this of mercury or iodine, and still less of arsenic.

You all know the accidents which can happen to interfere with the administration of mercury or iodine. Arsenic is apt to produce a peculiar cachexy, with irritable stomach and emaciation, at the same time that the spots of lepra may disappear, as they most frequently do, or they may continue untouched.

Arsenic is a two-edged sword, which those who use it had better handle with great circumspection, but which is better left in its sheath. Its efficacy is not so certain that we should be very anxious to use it. I have seen lepra return while the patient was still using it; and I have often seen it return very soon after the arsenical course has been discontinued. The most safe and prudent way of using it is that proposed by Mr. Hunt,—namely, to give it, not in increasing, but in decreasing doses, commencing with five minims of Fowler's solution, and aiming, not so much to give a large quantity, as to administer it for a very long time.

Tar is, as I have said, the safest remedy. The proper kind is the wood or Archangel tar,—*the pix liquida*. It may be given internally in capsules, or applied externally, or both. We have been administering it to Cope in both these ways. He takes fifteen or twenty minims three or four times a day, and at the same time he is tarred all over and lies in tar sheets. This latter part of the practice is scarcely applicable to private practice, but I believe it to be a most useful measure. About once a week Cope uses a warm bath to wash off the tar, and to enable him to ascertain what progress is being made in the cure.

Under this treatment Cope is making decided way; the scales are clearing off and many of the spots are evidently healing in the centre, where healthy skin is appearing. Allied to the tar is the remedy lately much commended for external use by Devergie, the *huile de cade*, which is obtained by distillation from the juniper.

O'Farleigh has been treated by good diet and moderate purging, with a little blue pill at night, and with the white mixture, consisting of Epsom salts and magnesia, in the morning, and warm bathing on alternate nights. He is improving very manifestly under this treatment.

No plan of treatment that I know of effects a radical cure of lepra or psoriasis. Whatever plan you adopt, the disease, whether it be antidotal or eliminative, is apt to return again. This is an additional reason why you should observe the caution I have given you,—namely to prefer the plan which will do no harm. You are not justified in running the risk of damaging your patient's constitution by using a remedy which at best can only procure a temporary cure.

Something, however, may be done to retard the recurrence of the malady. The continuance of eliminative measures, and the close observance of hygienic rules, will accomplish this object. Warm or cold shower baths once or twice a day, thorough good friction of the skin, good wholesome diet, and plenty of air exercise, are the means most likely to conduce to this end. In persons of delicate and strumous constitution, the cod-liver oil is very useful during the continuance of the eruption, and for some time after.

No treatment is so hard to carry out as that which enforces rigid and self-denying rules of health; and you will constantly find it easier to induce patients to swallow doses of nauseous and even poisonous drugs, than to take active exercise, or submit to a shower bath. The water-cure establishments, of which so many are now found in different parts of the country, are to a certain extent, useful for complaints of this kind; they are medical hotels, in which patients must do as they are told; they must be washed at certain times, and fed at certain times and on certain articles of food. But even all this washing does not cure lepra, for it returns as soon as the patient leaves the hotel, unless he continues to observe the discipline which alone can keep the malady under. A patient who has the lepra ought to know that he carries about in his system a dormant leaven, which needs but little to excite it to actual fermentation.

It is well for you also to bear in mind that it is no uncommon thing for lepra or psorasis to disappear without any treatment, and to return again, it may be, after a lapse of a considerable time. This is a feature of the clinical history which ought not to be lost sight of in estimating the value of different kinds of treatment.—*Med. Gazette, May* 16, 1851, *p.* 841.

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## 178.—TRAUMATIC TETANUS CURED BY SIMPLE LOCAL TREATMENT.

By Mr. Eddows.

[This case occurred in a labourer, aged 30. Fourteen days previously he had injured the ball of his thumb by striking his hand against a large packing needle. The wound was healed on the tenth, though a chemist had applied a suture and strapping. Three days after the healing, he noticed a stiffness of his jaws, and "all night felt a stitch or catch under the right shoulder-blade, sometimes going through to the sternum. When admitted into the dispensary, he could open his mouth to one and a half inches; he had occa-

sional cramps in the wounded hand; he could close his hand quickly, but extension was made with pain and slowly. The cicatrix was tender in one part. A portion of the cicatrix was now removed, including the tender part; and in the evening half a grain of the acetate of morphia, diluted with a little chalk, was applied to the wound, over which was placed a poultice. The tongue was clean and the pulse unaffected. On the second day, a blister was applied to the right hand, and the morphia applied to the denuded surface. The jaws were closer, and he complained of pluckings in the hand and arm; odcasional feelings of smothering in the chest. And he says that when he closes his mouth firmly, it gives his hand pain. On the fourth he is stated to be much the same. On the fifth, the spasms of the hand were fewer, and there was no pain in the hand when quiet. On the sixth the jaws were found to be still the same, though the hand continued better. He was now ordered to paint the tinct. of aconite over the flexors. On the 7th, the jaws remained in the same state, and he was ordered.]

To have ɱv. tinct. aconite on the wound, and then the morphia as before.

8th day.—Two hours after the application of the aconite and morphia, felt more ease than at any previous time; spasms fewer; says "the tightening of the chin is less;" jaws the same; bowels open; was not awoke, as before, by the plucking; an occasional stitch from sternum to scapula; ɱx. tinct. aconite to the wound.

9th day.—Still better; jaws a little more separated; pluckings confined to the wrist and hand. ɱxv. tinct. aconite.

10th day.—Blister on back of right hand nearly healed; last night, for an hour before the wound was dressed, for the first time had pluckings of legs, "as though they were drawn to the bed;" had also some pain at the lower part of the belly; jaws the same.

11th day.—The surface where the blister had been was quite healed, having no absorbing surface; had the pains in the legs last night, which made him shout loudly; cutting pain between the shoulders; "feels as though his loins were pulled together;" abdominal muscles rigid; right side more affected than the left; jaws the same. To have a blister applied above the situation of the former one.

12th day.—Dressed the blistered surface with the morphia, &c.; and, in an hour or two, was free from all his pains, and quite comfortable.

13th day.—The wound resulting from the removal of the cicatrix being nearly healed, a blister was applied on the wrist above for the application of the morphia, &c.: had no return of the attacks, except occasional twitching. Took quinine and valerian, and on the

18th day.—Ate lbss. of beef steak, and was lost behind the clouds of his own pipe.

There remained a contraction of the flexores, but this was removed by a splint; but the power of using the muscles has not yet returned.

There are many points of interest in this case, and I would wish to call attention to one of them.

*This man's symptoms first came on after the healing of the wound*,—a circumstance by no means unusual, though I am not aware that any reasons have been given why such should be the case. I think that one of Dr. M. Hall's experiments, showing that the extreme terminations of nerves possess the excito-motory power in a much higher degree than the trunk, will help us to furnish an explanation. "If," says he, "after removing the head of a frog, we divide the integuments along the back, and raise them by means of the forceps, we observe the *trunks* of many cutaneous nerves. Now, if we irritate these trunks, no movements follow; but if we irritate the cutaneous texture on which they ramify, movements of a *very energetic nature* are produced." Now, in the healing process of a wound it must be evident that the extreme distributions of the cutaneous nerves would only be involved when that process was nearly or wholly completed. And may it not be the involving these, the more easily excited terminal branches, that is the starting point of the disease?—*Med. Gazette, May* 2, 1851. *p.* 756.

## 179.—STRUCTURE OF THE MEMBRANA TYMPANI OF THE HUMAN EAR.

By Joseph Toynbee, Esq., F.R.S., Aural Surgeon to St. Mary's Hospital.

[The following is a most important addition to our previous knowledge of this structure, obtained by the persevering enquiries of Mr. Toynbee. He states that]

Betwen the epidermoid and radiating fibrous layers of the membrana tympani, there is a distinct and complete lamina of membrane which is continuous with the dermoid layer of the meatus. The presence of this membrane, to which, on account of its structure and functions, I have given the name of dermoid layer, is best demonstrated by carefully dissecting, under water, the membranous meatus from the upper surface of the osseous tube, as far as the attachment of the membrani tympani; at this point the periosteum of the meatus is seen to become continuous with the radiate fibrous lamina; this being cut through, the dermoid layer is seen passing down over the outer surface of the radiate fibres, and separating them from the epidermis. If the upper portion of this layer be drawn gently downwards by one hand, by means of a fine needle in the other, the delicate cellular tissue connecting it to the fibrous lamina can be broken up, and it may be removed entire. The presence of the dermoid lamina may also be shown by the introduction of a fine bristle between it and the radiating fibrous layer, at the superior part of the membrana tympani, and then by passing it down, the cellular tissue is lacerated. In a healthy state, when uninjected by blood or by artificial means, the dermoid lamina is thin and transparent; examined by the microscope, its structure is found to resemble areolar tissue. When injected, this membrane is observed to have numerous blood-vessels ramifying through it, and they form an elaborate plexus; when these vessels are enlarged, they give the red appearance to the surface of the membrana tympani which is so frequently met with during life. It is upon the supply of nerves to this membrane that the exquisite sensibility of the membrana tympani depends. A knowledge of the existence of the membrane here described is of interest to the anatomist, who recognises in it the secreting organ of the epidermoid layers of the membrana tympani; and to the surgeon, who by its presence is able to understand phenomena occurring in certain diseases of the ear which have been hitherto incomprehensible to him.—*Lancet*, *May* 10, 1851, *p.* 520.

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## 180.—EMPLOYMENT OF THE TINCTURE OF CANTHARIDES IN OBSTINATE ULCERS.

By John Tait, Esq., H E.I.C.S., Madras Retired List, Dunse, Berwickshire.

[Although it has been much advocated, the application of the tincture of cantharides in chronic ulcerations has not been much adopted in practice, Mr. Tait believes it well deserves attention. He says:—]

About five weeks since, a poor man from a neighbouring county placed himself under my charge respecting a severe ulceration of the right leg, from which he had suffered for eight months, during which period he had been treated unsuccessfully by five different medical men. On examination, I found the leg from the knee to the ancle to be nearly one continued mass of ill-conditioned ulceration, the small portions of skin still retaining integrity, being much congested, and of a livid purple colour. A profuse watery and offensive discharge, tinged with blood, issued from the affected parts; the edges of the sores were indurated and irregular, the ground of the various ulcers being deep and "scooped" out, and formed apparently of condensed cellular membrane. They had an angry and irritable aspect, and were attended with very great pain. The whole limb was much swollen. The patient had suffered from syphilis and syphilitic iritis, and as he still experienced nocturnal pains in the sound limb, I considered his constitution to be tainted by secondary symptoms. He complained of great weakness, and exhausting diarrhœa, and other symptoms of hectic. The following was prescribed:—Mercury, with chalk, five grains; sulphate of quinine, one grain; powdered opium, half a grain: mix for a

powder, to be taken thrice a day. The sores to be fomented three times a day with a strong decoction of poppy-heads; a poultice to be applied in the intervals; absolute rest, and elevated position of limb enjoined. The powders were continued until the gums were affected, after which the diarrhœa ceased. The limb was now less swollen and painful; warm-water dressings were substituted for the former local treatment employed, and the sores were bathed with a solution of the chloride of lime. The limb was now less swollen and painful; warm-water dressings were substituted for the former local treatment employed, and the sores were bathed with a solution of the chloride of lime. The following was taken internally:—Iodide of potassium, one drachm; compound tincture of cinchona bark, two ounces; water, fourteen ounces: mix. One ounce of the mixture to be taken morning, noon, and evening. As soon as the pain subsided, an ointment composed of balsam of Peru was exchanged for the water-dressing, the other remedies still being employed.

The tumefaction of the limb was now much reduced, and the sores had lost all traces of irritability, but remained stationary, and evinced no disposition to heal, the wounds being relaxed and gaping, with no perceptible appearances of granulations. He was now ordered to take ten drops of the tincture of cantharides with each dose of the iodide of potassium, the same topical applications being persisted in. Three days afterwards, the ulcers began to contract, healthy, firm lymph was effused round the edges, and red granulations appeared in the wounds. The iodide of potassium, with the chloride of lime wash, was now omitted, and he was directed to use the following:—Tincture of cantharides, twelve drops, three times daily, with the following draught:—Diluted nitric acid, twenty drops; compound tincture of cinchona, two drachms; water, one ounce. Red lotion. Continue the use of the balsam of Peru ointment.

Union continued rapidly to progress, and the ulcers were healed in a fortnight from the date of the commencement of the tincture of cantharides.

*Remarks.*—Such was the progress and issue of a case that had baffled every previous treatment employed. It affords one of many examples I could bring forward of the great utility of cantharides in indolent ulceration, dependent either upon atony of the engaged parts, or system generally.

In 1845, while resident in Burmah, my attention was directed to the treatment of the ulcers met with in that country, and which had long been found difficult to heal by different medical gentlemen stationed upon that coast. I drew up a paper, exhibiting the appearances presented by the different ulcers, and the states of constitutional derangement with which they were identified, and in which I had employed the tincture of cantharides with marked success. The paper alluded to, backed by several cases treated by different medical friends, was forwarded to the Madras Medical Board, who ordered it to be circulated throughout the medical service of the Madras army.

A few extracts from the paper here referred to will show the character of the ulcers where I found the tincture of cantharides useful:—

*Extracts.*—1st. "Where the granulations were exuberant, but pale, weak, and flabby.

2d. "Where there was deficiency, or total absence of granulations, the ulcers being deep and scooped out, with raised and indurated edges.

3d. "Where the granulations were not defective, but cicatrizing irregularly, sometimes in the centre, at other times on one side, the lymph which was thrown out and organized one day being absorbed the next.

"It was further remarked that their indolent character was to be referred to morbid states of the system, varying from little perceptible deviation from health to the different grades of anæmia. It was difficult, at first, to assign the cause of this indisposition to heal, in sores which presented themselves in subjects where the general health was little impaired, and this was increased on finding that they did not yield to the exhibition of remedies known to exercise a beneficial influence upon such ulcers. It was from observing the ineffective attempts at reparation which I occasionally witnessed in the different cases that came before me, that suggested the belief of the primary derangement to be owing to deranged circulation of the affected part, and the blood being defi-

cient of, or not elaborating, plastic lymph of sufficient quantity or quality necessary for the healthy granulating process."

My reasons for coming to these conclusions may be briefly stated. The local derangement of the circulation was inferred to exist, from the pale colour of the ulcers, the paucity of granulations, and the hard, indurated bases. The deficiency of lymph was seen by watching the character of that thrown out; it appeared as a thin, scanty epithelium, of a bluish, almost transparent colour; was long in acquiring the features of the contiguous skin, and was altogether divested of the whitish, thick, or flesh-coloured appearance which healthy and well secreted lymph usually presents.—*Lancet*, *May* 10, 1851, *p.* 510.

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## 181.—CASE OF PREGNANCY, WITH IMPERFORATE UTERUS.

By Dr. Edward T. Roe, Glasgow.

[The following is a brief extract of this case which was published fully in 'Guy's Hospital Reports.']

Case.—Eliza P——, aged 23, a stout, robust, and healthy woman, was taken in labour with her first child in the night of Nov. 14th, 1836. She had been married on the 4th of the previous Feb., and had never menstruated since; but before her marriage, from the age of fourteen, the catamenia had appeared every four weeks, and sometimes oftener. Four or five days before labour commenced, a considerable discharge of thin reddish fluid appeared, and continued for forty-eight hours, unaccompanied by pain. After very careful examination, I could detect no os uteri; every pain forced down into the vagina a globular mass, as large as the fœtal head, but without any opening or mark where the os had been, beyond a slight thinning or puckering at the most dependent part. The pains continuing severe and constant without producing any alteration in the condition of the uterus, I requested Mr. Tweedie's aid, and in the night of the 15th Dr. Ashwell's assistance was also obtained. He arrived at eleven p.m. She had then been in active labour twenty-three hours, seventeen of which I had been in constant attendance on her; the pains were still unabated in force, but her bodily strength was now fast failing; her pulse was quick and irritable; tongue dry and injected; skin hot and feverish; and her features pinched and anxious. Dr. Ashwell's most careful examination satisfying him that the os uteri was obliterated, and the condition of the patient warning him that no time was to be lost, he proceeded to incise the uterus by passing a curved sharp-pointed bistoury, guarded by the left forefinger, to that part where the walls appeared thin, and where a slight dimple or puckering could be felt, and cutting forwards and backwards to the extent of about an inch and a half in each direction; scarcely any blood was lost; the liquor amnii immediately gushed forth, and the child's head fell on the artificial opening, which appeared to be about an inch and a half in diameter. The pains were less violent than before the operation, until four a.m., (the 16th), when suddenly the edges of the incision split up in two directions, one anteriorly about two inches, the other backwards and to the left side, farther and beyond the reach of the finger. She felt faint, the pulse became fluttering and almost imperceptible, and the skin cold and clammy, but she eventually rallied, and at eleven a.m. was delivered of a living child, which was with difficulty recovered from a state of asphyxia.

The subsequent progress of the patient was satisfactory, and on the 25th she was convalescent.

About a month after, she was examined, and the following report made:

The vagina is short. There is no cervix uteri. The uterus is reduced to nearly a normal unimpregnated state. At the extremity of the vagina there is a puckered, irregular orifice, into which the tip of the finger can enter; it is soft, with smooth and thick edges, not perfectly circular, in consequence of certain indentations, as if from the drawing together of several small rents. Radiating from this central aperture can be distinctly felt three ridges like lines of adhesion—one forwards towards the right ilio-pubic junction, traceable nearly to the reflexion of the vagina; one opposite to this, backwards towards the left sacro-iliac synchondrosis, whose extremity is lost in the reflexion of the vagina; and the third of short extent, about one third of an inch long, passing backwards and to the right side.

In January, 1839, she was again confined, when, from the rigidity of the previous opening, it was found necessary to divide the edge of the cicatrix in several places before the child could be born.

Objections similar to those of Dr. Fairbrother in Dr. Sheppard's case were made in the '*British and Foreign Medical Review*' to the treatment of Mrs. P——. The incision was thought justifiable; but it was suggested, "that had a free venesection been premised, and some further time given, an os uteri might have been found."

But Dr. Ashwell does not hesitate to assert that the operation was delayed even beyond the bounds of safety; for "from anxiety not to incise the uterus, if it could be avoided, the woman was permitted to incur more risk than was justifiable."

"I am confident" he goes on to say, "so far at least as it is possible to be confident, in cases where a high probability must be our only guide, that where fatal results have occurred, they might often have been prevented by timely incision of the parts.

The supposition that an opening existed, but was undetected from mal-position of the uterus, is, I think, scarcely deserving consideration, when it is recollected that the tendency of the labour pains would be to bring the uterus sufficiently low down to admit of accurate examination, as well as to alter any previously existing obliquity.—*Lancet*, *May* 24, 1851, *p.* 569.

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## 182.—THE CHARACTERISTIC PECULIARITIES, PATHOLOGY, AND TREATMENT OF RHEUMATISM;

### MORE PARTICULARLY AS IT IS FOUND PREVAILING WITHIN THE TROPICS.

By Dr. James Bird, A.M., London.

[In a paper published in the 'London Journal of Medicine,' (March,) Dr. James Bird, in consideration that the practice pursued in rheumatism, is undefined and somewhat empirical, one employing lemon-juice, another colchicum, and a third a purely alkaline treatment, without any explanation of the principles or differences of diseased condition, on which such opposite systems of treatment are recommended, has studied the disease, as met with in Europe, and compared it with that prevailing within the tropics, among a class of patients subsisting almost exclusively on non-azotized articles of diet. The great prevalence of rheumatism, and the severity of some of its forms, both among Europeans and Natives in India, originating under atmospheric conditions and habits of life so different from those under which it is found prevailing in this country, seem well calculated to afford light into the nature of an obscure disease, which may be said to be protein in its modifications. Dr. Bird's observations are confined to three points. 1st. Leading varieties of tropical rheumatism, and the particulars in which rheumatic inflammation differs from simple suppurative inflammation. 2d. Origin of the rheumatic diathesis, nature of the paroxysmal fever accompanying articular inflammation, and causes which produce them. 3d. The general principles of treatment.

Tropical rheumatism presents two principal forms, the steno-phlogistic, or acute; and the astheno-cachexical or chronic. The former, in its attack of particular tissues, shows a preference for the compound membranes of a serous and mucous kind; the latter affects the muscular, nervous, and filamentous tissues, including the aponeurotic expansion of muscles and the periosteum, having much of a neuralgic character, and being accompanied by vitiated nutrition, and wasting of the parts affected. The very acute variety, associated as in Europe, with pericarditis, or endocarditis, is a form of the complaint seldom presented to observation in India; though cases in which the ordinary symptoms of heat, pain, redness, and swelling of the joints, accompanied by fever, are present, occur both among natives and Europeans. Such attacks usually happen among those inhabiting the colder, dryer, and more elevated table-lands of that country. The astheno-cachectic varieties, associated with different forms of periostitis having all the character of mercurial syphilitic cachexia, are peculiarly the produce of malarious districts. Several interesting cases of these different forms are given, in illustration and proof

that astheno-cachectic rheumatism, associated with arthritic periostitis, is a state of constitutional *cachemia*; more frequently developed among the natives of India, than among Europeans after mercurial treatment. The proclivity of native constitutions to this form of disease is said to arise from the more general use of non-azotized articles of diet by the natives than by Europeans; giving to the former less vital power of resistance to the destructive metamorphoses of the tissues, brought on by cold, and abused courses of mercury. As cachexia advances in cases of this kind, attended by complication of rheumatic symptoms, the skin becomes harsh and dry, and is covered by white scales or papular eruptions, having all the character of obstinate psora. The intimate existing sympathy between the skin and epithelial covering of the intestinal mucous surfaces, is deemed to afford sufficient explanation of the occasional association of cutaneous eruptions with derangements of the primary assimilation and intestinal mucous surfaces, as observable in the different forms of arthritic complaints.

The intimate relation that subsists between milder and modified degrees of scorbutic *dyscrasia*, and the forms of astheno-cachexial rheumatism, is then pointed out. This connection has of late years been almost lost sight of, notwithstanding that the great and accurate observer, Sydenham, described a species of rheumatism resembling scurvy in its capital symptoms, requiring nearly the same method of cure: and which he distinguished by the name of *scorbutic-rheumatism*. This species of the disease will be found under ordinary circumstances on shipboard, and among European sailors using in excess salt meat diet, with little or no admixture of succulent vegetables; as well as among bodies of men on land, living on farinaceous seeds destitute of anti-scorbutic properties, or on a diet of unvaried character, with total abstinence from animal food. Such are the circumstances, aided by extreme aridity or dampness of climate under which land scurvy prevails among prisoners in the jails of India, and also among bodies of native troops in particular seasons and localities. The same unvaried farinaceous character of diet, used by many of our Sipahies, predisposes them to attacks of cachexial rheumatism. Several cases of this kind of scorbutic rheumatism are given in illustration, wherein lemon juice, with an allowance of potatoes and fresh meat diet, was found to be of much service in aiding the other means of cure.

The graduated forms of rheumatism just described, derive more of their difference from constitutional causes of distinction, and the less or greater aberration of the blood from its normal state; and though the distinctions of the disease, according to its seat in various parts, are thought to afford less important grounds for opposite therapeutical principles, and modes of treatment, than the differences deduced from constitutional causes,—still the varieties founded on localities are deemed of importance as guides to practical results. The best description of such varieties is considered to be that adopted by M. Chomel;—1st, articular rheumatism, or rheumatism in the joints; 2d, muscular rheumatism, or rheumatism of the voluntary muscles; and, 3dly, visceral rheumatism, or rheumatism of certain fibro-serous tissues, situated within the splanchnic cavities.

The generality of cases belonging to the first form as met within the tropics, oftener present symptoms of the mild chronic variety than of the intense articular rheumatism of European climates; and though attacks are generally ushered in by febrile symptoms, these symptoms are of less severity than in colder climates, and the disease is less mobile in character. Muscular rheumatism, too, though observed in every part of the body, and usually more amenable to treatment than cases of the articular form, is more frequently met with in the loins and muscles of the limbs than in any other part of the sarcous tissues. This is peculiarly a disease of malarious districts, being very prevalent among the men of native regiments when located in such.

Dr. Bird then proceeds to inquire whether the phenomena of rheumatism be identical with those of inflammation and the phlegmasiæ? Though rheumatism appears with all the phenomena of the latter, its local inflammation still possesses a specific character more symptomatic than idiopathic in nature, and manifesting in progress that the symptoms proceed from a particular com-

stitutional taint, which gives to them a character distinct from simple inflammation. Rheumatism generally presents quite as much of the character of the *neuroses* as of the *phlegmasiæ*; and though evidence be not wanting to prove that acute articular rheumatism sometimes terminates in suppuration and purulent effusion into the joints affected, still rheumatic inflammation differs from simple inflammation, inasmuch as it proceeds from a specific cause and is associated with greater abnormal sensibility of the nerves.

Regarding the origin of the rheumatic diathesis, rheumatism is considered as the result of that pre-existing lesion of the assimilating and excretory organs of the body, which, on the application of cold, errors of diet, intoxication, malaria, and like exciting causes, gives rise to that abnormal change of the blood which constitutes the rheumatic diathesis. Sometimes the blood seems altered previous to the appearance of swelling and local rheumatic inflammation; but, occasionally, where the disease is produced by cold acting on constitutions little or not at all disposed to rheumatism, the altered condition of the blood probably follows the development of the local affection.

In either case the heightened metamorphic power of the blood globules gives rise to a greater relative formation of *fibrin* and progressive diminution of *hæmato-globulin* as they occur in rheumatic fever and its consequences. The natural tendency of rheumatism is to *anæmia*, and to the production of phenomena depending on a diminution of the blood globules, as lately prominently noticed by Dr. C. Ferral, in his observations on rheumatic cases with endocardic complications; where, after the employment of depletion and mercury, a cardiac bruit different from that which originally presented itself, continued to persist, notwithstanding the steady employment of means for subduing inflammatory action.

That morbid condition of the blood, which constitutes the *rheumatic dyscrasia*, occurs in all cases where the circulating fluid either becomes deteriorated by the absorption of foreign poisonous matter, as in gonorrhœa, and in certain exanthematous diseases, accompanied by primary and secondary symptoms; or by the reversion into the blood of increasing morbid secretions, as in uterine affections that give rise to diseased conditions; which, though now fashionably treated as local disease by caustic and other like applications, are often, indeed, results of this very state of constitutional *dyscrasia*.

The anatomical seat of rheumatism is peculiarly confined to the fibro-serous tissues, including articular capsules, cellular tissue, mucous follicles, synovial glands, the interior ligaments of joints, the muscles and tendons, the dura mater as reflected on the medulla oblongata and spinal cord, the pleura, the peritoneum, and nerve tubules. The localized manifestations of disease are accompanied, according to age, temperament, and previous habits, by almost opposite conditions of the blood, states of *hyperinosis* and *hypenosis*; which differences of constitutional cause give the rheumatic swelling of the joints more or less the character of ordinary inflammation. The local swelling of sthenophlogistic rheumatism differs from ordinary inflammation in having more a character of irritation than the latter; but, according to the researches of M. Andral, agrees with it in this, that the fibrine in the blood increases from two-and-a-half or three to as much as ten parts in one thousand, oscillates in the sub-acute form between four and five, and returns to the natural standard in well marked chronic cases. This state of *hyperinosis* is, however, rather relative than absolute, being accompanied by a corresponding diminution of the red corpuscles; which, as Simon supposes, are wasted in the metamorphic production of the fibrine.

We come next to the treatment—on which subject Dr. Bird says—the general therapeutic principles to be followed in attacks of tropical and European rheumatism, are—1. To subdue constitutional irritation and fever by narcotics and refrigerants. 2. To eliminate from the system the retained cholæic elements, and other excrementitious matters of the blood, which render the urine acid, and occasion its lithic deposits. 3. To restore the conditions of normal nutrition by suitable diet in the stheno-phlogistic kinds, and by iron, cod-liver oil, and tonics, when the rheumatic symptoms are associated with *cachemia*.

4. To subdue local symptoms of swelling and pain by leeching, cupping, and blisters, followed by anodyne applications, or local anæsthetics.

In order to fulfil the first indication, which is the principal and leading one, in cases of the stheno-phlogistic kind, much professional discussion and difference of opinion have arisen, regarding the efficacy and propriety of general bleeding, as one of the means. The extent to which this remedy may be usefully employed, will depend much on the youth and naturally plethoric constitution of the patient, the inflammatory character of the local affection, the severity and tonic nature of accompanying fever, and the purity and bracing influence of the air to which the patient has been habitually exposed. The degrees of fever are found to correspond generally to the coldness and purity of the air in which the patient has lived, the azotized richness of his diet, and the proportionate *hyperinosis* of the blood accompanying good air and rich nourishment. In a general inflammatory diathesis, therefore, the propriety and efficacy of general bleeding are fully established by our own experience, and recommended by a host of unexceptional authorities. But the natural tendency of rheumatic inflammation and fever being to produce anæmia, we must not be too prodigal in wasting the nutritive resources of the constitution; and should be guided in repeating the bleeding, according to the quantity and inflammatory firmness of the blood-clot, and the effect which the first bleeding may have had in subduing irritation and mitigating fever. The same extent of general blood-letting, that might be useful to the temperate and well-fed inhabitants of cold salubrious localities, would be highly injurious to the nervous, irritable, bodily habits, of those addicted to excessive beer-drinking and other dissipated practices. The same quantity of blood, then, abstracted to cure quickly the plethoric mountaineer of Scotland, would endanger the life, or render tedious, the convalescence of an inhabitant of London, breathing an atmosphere deteriorated by sulphuretted hydrogen. The necessity, too, of general bleeding in tropical rheumatism is rather an exception than the rule, as might be expected from the comparatively mild character of its fever and inflammatory symptoms.

To carry out further this indication, after a moderate bleeding, recourse may be had to ten-grain doses of nitrate of potash, given along with small doses of tartarized antimony and citrate of potass, three or four times a day, in the form of effervescing draughts; or the nitrate of potash may be combined with nitrous ether and other diuretics; the intention in either case being to subdue heat and irritation, by restoring the normal excretory functions of the skin and kidneys. The utility of nitrate of potash seems dependent on its power of diminishing the plasticity of the blood and suspending the metamorphic disposition of the blood globules to produce fibrine. Under its use the specific gravity of the urine is increased, this being a medicine which possesses the power of eliminating urea and other compounds of lithic acid from the system. Such power is probably increased by the combinations of nitrate of potash with other alkaline compounds, as the citrate and acetate of potash, which are converted into carbonates in the course of the circulation. All such means, however, prove refrigerant by subduing the heat and irritability of the body; and the effect of such may be greatly increased by the addition at bed-time, of anodynes, either opium or aconite.

Of medicines best adapted to carry out the second indication, calomel and Dover's powder at bed-time, followed next morning by a solution of sulphate of magnesia in compound senna infusion, with the addition of an alkali and colchicum, will be found among the most useful. Much misapprehension regarding the beneficial therapeutic action of the latter medicine seems to exist; some deeming its chief efficacy consists in its power of eliminating urea and uric acid from the system; while others deny to it any efficacy in subduing symptoms of true rheumatism. It is chiefly useful in cases of the acute disease, accompanied by a foul loaded tongue, biliary derangement, and intestinal mucous accumulation. Both our Indian and European experience has convinced us of the fact, that without its purgative effect being induced, the urinary secretion is seldom so much increased in quantity as to bring with it any considerable relief of rheumatic symptoms. The most beneficial mode of

administering it in India is to give the wine of colchicum twice or thrice a day, in a weak solution of tartarized antimony, along with liquor potassæ, and tincture of the hydrochlorate of morphia. Free action of the kidneys and skin is thus kept up, and the feverish frequency of the pulse reduced; but, even in such a case, the use of purgatives, and the elimination of the biliary secretion, must not be neglected or lost sight of. Where diarrhœa, or the purgative effect of colchicum is established, there the amount of urea and uric acid in the urine appears to be diminished; these compounds being eliminated, as would appear, by the intestinal evacuations. Dr. Bodcker, in a late minute examination of the action of various medicaments, with reference to the changes produced by them in the constituents of the urine, the exhalations of the lungs, and the blood, found that, contrary to the general opinion of pharmacologists, the use of colchicum produced but slight diuretic action, and had very little effect on the constituent parts of the urine. During its employment, the activity of the skin and lungs, in exhaling carbonic acid, is considerably augmented, and after a time its effect in causing an augmented secretion of bile becomes apparent; the melanotic blood globules, which are unable to combine with the oxygen of the air, being destroyed in the hepatic system, afford materials for an augmented secretion of bile. The result of his analyses, thirteen in number, on the action of colchicum and its known utility in rheumatism, seem to bear strongly on the truth of the opinions expressed as to the pathological nature of this disease.

The employment of calomel, with a view of obtaining its full purgative effect in cases of the stheno-phlogistic variety, should be more steadily pursued to carry out this indication than the plan of giving it with opium in order to obtain its constitutional effect. From its special action on the biliary organs, it is in Indian rheumatism an invaluable remedy; and in this country too, when properly administered in aid of colchicum and other purgatives, will be found of much utility, by depurating the blood, through increased biliary secretion, in those hyper-carbonized states of the system associated with the disease in many of those cases met with in London. The practice of mercurial fumigation, as successfully used both in this country and in India, proves useful by increasing the elimination from the skin, and restoring the cutaneous functions to a normal state. The same result may be partially secured in both varieties of the disease, by means of warm bathing, warm clothing, and friction of the surface.

The third indication has more immediate relation to cases of the asthenocachexial kind than to those of acute rheumatism. The impaired state of the digestive function being so intimately associated with the origin and progress of the rheumatic constitution, it is of much importance, while carrying out the second indication, in acute varieties of the disease, that due attention should be given to the diet of the patient, which must be diluent and of easy assimilation. In the early stage of disease it should consist of gruel, thin arrowroot with milk, or weak broth; and if beef-tea be allowed, it may be given with the addition of twenty or thirty drops of the liquor potassæ; the alkali serving to neutralise the lactic and other acids which accumulate in the stomach along with diseased mucous secretions. As phlogistic symptoms, even in the worst examples of acute Indian rheumatism, are associated with much destructive irritation and waste of tissues, a too active or injudicious employment of the diaphoretic and purgative treatment must be avoided, as such will both derange the primary and secondary assimilation. Such derangement is marked by emaciation, loss of strength, pale anasarcous visage, and other signs of cachexia; and as the early appearance and rapidity of such symptoms are most remarkable in persons inclining to the leuco-phlegmatic temperament, the treatment for carrying out the two previous indications should not be such as makes too great a demand on the resources of the constitution. When cachexia appears, we must have recourse to the bark, sulphate of quinine, preparations of iron, or iodide of potassium, all of which operate beneficially on the constitution, by improving the tone of the organs of primary assimilation, modifying the nutrition of the tissues, and increasing the *hæmatine* of the blood. A combination of these several remedies may be necessary,

according to the nature of particular cases; and where iodide of potassium, if given alone, would utterly fail in relieving symptoms, it may be usefully employed in combination with the bark, or sarza-decoction, or extract of taraxacum, by which the double effect of healthy cutaneous action and increased elimination by the kidneys may be generally secured. The iodide of potassium must not be given in large quantities, but along with it laxatives are as essential as in using colchicum. In many such cases, the compound decoction of sarza, to the extent, at least, of half a pint twice daily, with an equal proportion of warm milk, has been found to be of much utility in promoting the nutrition of the tissues and bringing back healthy cutaneous action. The extract of sarza pills, with resin of guaiacum and sulphuret of antimony, may be given advantageously with the same object, care being taken to supply the patient with light easily digested elements of nutrition. Among such elements we may mention cod-liver oil, which in two cases when prescribed in this country, proved of much benefit. One of these was a case of excruciating pericranitis, affecting the aponeuroses of the cervical vertebræ, and accompanied with neuralgia of the superior maxillary branch of the fifth pair of nerves; the other was hysterical neuralgia of the intercostal muscles. In both cases counter-irritation was employed by means of a liniment of oil of turpentine with pyroligneous acid over the pained parts; and in the former the oil was given along with the extract of aconite at bed-time.

The last and fourth indication is to employ remedies suited to subdue the pain and swelling of the local affections. If such are of a muscular kind, strongly stimulating terebinthinate liniments, warm fomentations, and shampooing of the parts, will be found beneficial in relieving pain; but in some cases, such was its severity and persistence, that the patients were relieved by nothing except the abstraction of blood from the parts by means of cupping-glasses. When the joints suffer, and are much pained and swollen, we found no local applications more useful than leeches and repeated blisters to the parts. If the latter be employed, the blistered surface may be dressed with an ointment containing small quantities of the hydrochlorate of morphia, or extract of belladonna. The application also of a wet bandage, saturated with a lotion of camphor mixture, wine of colchicum, and tincture of the hydrochlorate of morphia, covered over by cotton wool and a piece of spongio-piline to prevent evaporation, will be found of much utility. Others have of late recommended for the same purpose a chloroform lotion, or one of Dutch liquid, stating such to be of great utility in relieving the pain and swelling of the joints; but though we have had no experience of their efficacy, they appear well calculated to fulfil the same intentions as other like remedies which have been long in use. More might be said as to the greater or less efficacy in rheumatism of special remedies, but as we place little faith in such when used without discrimination, we defer any such remarks to a more fitting opportunity, the great object of this paper being to delineate the leading characters of rheumatic disease, and the therapeutic indications most applicable to each.

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## 183.—BURNS AND SCALDS.

By Samuel Crompton, Surgeon, Manchester.

[In a report on burns and scalds, drawn up for the Provincial Medical and Surgical Association, Mr. Crompton has given a complete abstract of those papers on this subject which were received by him from the practitioners of the provinces, most of which had already been printed *in extenso* in the 'Provincial Medical Journal,' and of some of which an abstract has been given in previous volumes of this 'Retrospect.' Mr. Crompton's abstract is interspersed with such reflections as have arisen in his mind on this important topic during the years 1847-8-9 and 50. He begins by giving a list of the names of those gentlemen who contributed the information on which the report is founded; he then states that "the real object of the inquiry was not to elicit a series of papers containing entirely *new* views, but to ascertain which of the numerous plans of treating burns, recommended in systematic treatises, are adopted by the profession, and what are the prevailing views respecting their value." He

then directs attention to the frequency of burns in the provinces, and to the large experience which provincial practitioners must necessarily have of these accidents, and consequently, how valuable must be their opinions on their treatment. He speaks of the materials placed at his disposal by his professional brethren as "constituting a mass of practical information of very great value," and proceeds with his report. He objects to the received classifications of burns as being calculated to mislead the practioner, and for not taking into account the three most material points, viz: the immediate effects produced on the constitution of the patient, and the superficial extent of the burn. He proposes a classification based upon these points, which he says are essentials of a good practical classification. If any influence is brought to bear upon the human body, and produces effects which are not compatible with the easy and due performance of the vital functions, the nervous system has the power of so adjusting the action of the injured parts, or of those which are adjacent, as to compensate for the mischief, by either restoring the part to health, or making its loss or injury as little prejudicial as may be. So in a kingdom, if an insurrection takes place in (we will suppose) some distant part, the local authorities, holding their power from the higher, may, if it be of small extent, suppress it without requiring the help of the central government, and the latter may scarcely feel it or be affected by it; but if the magnitude of the danger be such as to require greater force for its removal, the central or governing power may be so far affected by it as to be paralysed, or it may feel the magnitude of the danger so accutely as to be roused to the most strenuous action, everything else being set aside except the suppression of the insurrection. So it is in the body: if the injury done by a burn be—

1. Local; that is of so small an extent as not to affect the nervous centres so as to produce any of those symptoms which are usually spoken of under the generic term *shock;* the adjusting power of the parts adjacent to those injured, seems to be nearly sufficient to repair the mischief, and what the nervous centres contribute does not interfere with their other relations. In these cases, the pain from the burn is usually very severe; the patient acts for himself, his perceptions and sensibilities are neither lessened nor prevented, nor is the circulation much quickened or depressed, nor are there shiverings. But if the mischief done to the injured part be of greater importance, the condition of the system is the best, and certainly the only sure guide to us in judging of its gravity. Here the local affection is secondary in importance, and the management of the burned part is to be regarded less than the derangements of the nervous centres, and the train of symptoms which immediately begin to spring from the shock communicated to them. These, it seems to him, form a distinct class, which may be termed

2. Constitutional, or vital burns, which are capable of several divisions according to the severity of the constitutional symptoms. Shivering (though not enumerated by Dupuytren among the effects of burns) is one of the most striking features in cases which come under the observation of English surgeons; and it seems to Mr. C. to be the most important of the early symptoms as a guide in showing whether, or how far, the constitution suffers from the burn. If the pain in the burned part is complained of as a very severe burning pain, and there is *no shivering*, the case is generally one which will recover. If, however, there is shivering, and the patient does not seem to suffer much burning pain in the part, there is danger; and the treatment must be mainly constitutional. In proportion to the severity of the shivering, and the frequency of its recurrence, will usually be the danger of the burn. Hence, then, the importance of the existence of shivering, and its recurrence as a test of the severity of a burn; and, therefore, as a line of demarcation by which we may separate those cases which require *constitutional* treatment chiefly, from those which require merely *local* treatment.

It is curious that, as a result of the application of heat to the body, it should be possible to draw such a distiction, as that one class of cases should be complaining of the intense heat in the injured part, whilst the other class should be shivering. Mr. C. also adds that it is probable that the conflicting and perplexing statements respecting the efficacy of remedies in burns, depend

mainly on this difference in the condition of the system. If there be the feeling in the part of burning heat, we can understand how cold applications would be grateful; and further, how the case would get well, even though they were not the best, for the powers of the nervous system are intact. But surely no one would recommend the continued application of cold to a patient labouring under the depression and shivering attendant upon a severe burn.

Another novel view started in this report, has reference to the principle on which external applications to burns are beneficial. It has generally been held that they do good chiefly by *excluding the atmospheric air*. Mr. Crompton considers this explanation to be unphilosophical. It appears to him to be incorrect to regard the air which we can take into the minute texture of our lungs as an irritant to an external sore. If the air is as injurious to the skin when it is excoriated (as it is commonly supposed to be) might it not be expected that it would be *very irritating* to a mucous membrane, even when in a healthy state? But it is not so; and further, if the air which passes over an inflamed mucous membrane be *warm*, it does not appear to harm it; but when the air is exceedingly cold, it does harm, not only to the inflamed but to the healthy mucous membrane, especially to the lining of the respiratory organs. As an example of the irritant effect of cold air on the mucous membrane of the nostrils, he instances the increased discharge of mucus from them on a frosty morning, and the pain which is then felt when the cold air first enters the nostrils immediately after sneezing or blowing the nose. In warm weather, the air produces no such painful effect. He concludes, therefore, that it is the accidental circumstance of its coldness which is pernicious. Air of itself, *air as air*, produces no irritation; but *cold* air, that is air destitute of a given portion of caloric, produces much irritation. Bearing in mind the analogy which exists between skin and mucous membrane, it can hardly be supposed that air will be more injurious or irritating to the skin than it is to the mucous membrane of the respiratory organs. And if *warm* air can continually pass in a current, and in large quantity, over the inflamed mucous membrane of the mouth, nostrils, or bronchi, without producing much irritation (if any), can it be supposed that air, if warm, does harm to any sore or wound of the skin? Is it not more just to suppose that it is the fact of its possessing a greater or less amount of sensible heat which renders it injurious or the contrary? By appealing to the process of nature in the healing of wounds, he finds a confirmation of these views: blood or serum coagulates upon a wound, and forms a dry scab, which is not only an excellent mechanical defence to the sore, but a powerful non-conductor of heat. There is a close agreement between what we observe of this process of nature and the results of experience; for surgeons take as the basis of their dressings such animal and vegetable substances as are known to be the best non-conductors of heat, e.g., spermaciti, wax, suet, resin, animal and vegetable fixed oils, isinglass, mucilage, &c. So exact is the agreement between theory and practice that, according to Dr. Duncan, the three classes of outward applications—"ointments, cerates, and plasters, are *all* combinations of fixed oil or animal fat with other substances;"—that is to say, their basis consists of those substances which in the living animal or vegetable resist sudden changes of temperature, and, in the former, play a most important part in the maintenance of the animal heat. Such external applications as lint, simple poultices, and the water-dressing, do not appear to be exceptions to this law, as he tries to prove. He does not, however, attribute all their efficacy to their non-conducting power, for he states that, for the most part, they are also idioelectrics and non-conductors of electricity; circumstances probably of much importance. Neither is it to be inferred that he holds that non-conductors do good by imprisoning the animal heat; for he mentions that though they are non-conductors, yet that they have a large capacity for heat; that they serve to preserve uniformity of temperature in the injured part, and tend to soothe the nervous irritability of the injured part, by preserving the nerves from feeling the variations of temperature in the currents of air which would act upon the surface. If the view which he takes be correct, *the thermometer becomes an important instrument in determining the therapeutical value of external*

*applications;* and scepticism entertained by some respecting the value of cotton, treacle, flour, &c., is shown to be unphilosophical.

Our space will not permit us to give further extracts at present. In a future volume we hope to give more, and we must refer our readers to our present synopsis of treatment for further information.]

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## 184.—METHOD OF DEPRIVING QUININE OF ITS BITTERNESS.

[Dr. Richard H. Thomas, of Baltimore, reports the discovery of a method by which quinine may be quite deprived of its great bitterness without injuring its virtues. He combines two grains of tannic acid with ten of quinine. —*Amer. Jour. Med. Science, April*, 1850.—*Med. Times, June* 15, 1850, *p.* 440.

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## 185.—INHALATION OF VARIOUS MEDICAL SUBSTANCES.

By Dr. John Snow.

[It is natural to suppose that many agents exert a greater local power over the mucous membranes when inhaled, than when they pass through the stomach, and reach the lungs by the circulation only; in fact, some, as chlorine and ammonia, could not be so if exhibited in any other way. As to the mode of inhalation.]

The most important of the additions to the mechanical means for inhalation, which followed the discovery of etherization, is the flexible face-piece, to include both the nostrils and mouth. Dr. Sibson introduced this, although Dr. Hawksley contrived a similar one about the same time. It is shown in the engraving, which accompanies this paper, in the modified form in which I use it. The sides and margin, which form the flexible part, consist of thin sheet lead, lined with oiled silk, and covered with leather. The expiatory valve can be moved more or less to one side from the opening it covers, so as to admit unmedicated air, whenever the vapour feels too pungent. The advantages of a face-piece of this kind are, that it can be fitted to every variety of face; that the patient requires no instructions, having nothing to do but continue breathing in his usual way, either by his mouth or nostrils, as he pleases; and that it imposes no labour on the respiratory muscles, for when applied to any suitable form of inhaler, it may be kept attached to the face for any length of time without fatigue. As I recommend the face-piece in every kind of inhalation (except where substances have to be drawn into the larynx in the form of powder, when a glass tube may be used), it has been described before treating of individual medicines, to which attention may now be directed.

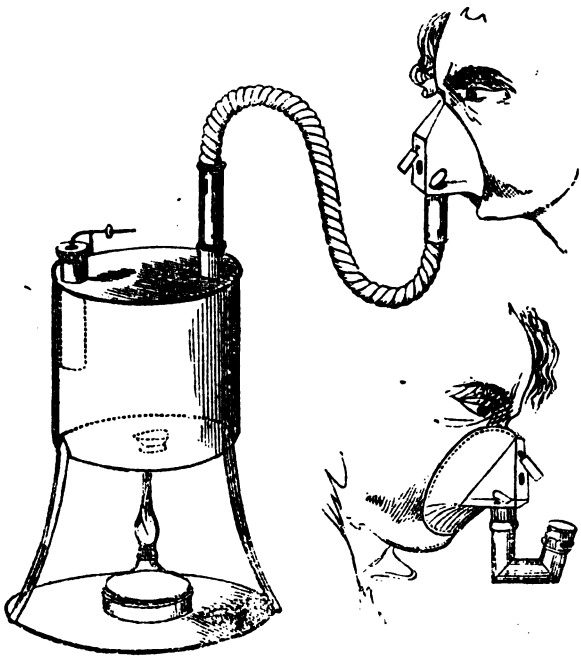
[Opium is very extensively inhaled in China and India, as an indulgence: but the temperature required is sufficient to decompose pure morphia or the meconate, or about 400° F.: hence, the effects seem to be produced by the generation of new products by the heat applied. The Chinese use a pipe for the inhalation of opium, heated over a spirit lamp, using at one time a piece of the watery extract the size of a pea. Dr. Snow continues:]

I have contrived an inhaler, which is adopted for a great number of other medicines as well as opium. (Fig. 1.)

It is made chiefly of tin, and consists of a cylindrical chamber, between four and five inches in diameter and three or four inches deep, under the centre of which a spirit lamp is placed, The bottom of the inhaler consists of a thin piece of talc, on which is placed a small capsule of Berlin-ware, for the purpose of holding the extract of opium. A porcelain funnel-holder, which is placed on the talc, keeps the capsule exactly over the flame of the lamp. The talc allows sufficient heat to be transmitted to the opium, without conducting it to the sides of the inhaler, and, consequently, the air which is inhaled is not unduly heated. The lid of the inhaler is moveable; it is provided with a delicately balanced valve for the admission of air, and is connected with the face-piece before mentioned, by means of an elastic tube of wide calibre, as shown in the engraving. (Fig. 1.)

The extract of opium, in the form of a pill, is placed in the capsule without any addition, and the spirit lamp is lighted beneath it with a very small flame,

which may be increased if requisite. The patient begins to inhale immediately the lamp is lighted, and continues to do so as long as anything is given off. The moisture contained in the extract is first expelled by the heat and inhaled, then follow the active principles of the opium, accompanied, after a time, with some smoke, and nothing is left but a porous carbonized mass. The process, being conducted slowly, usually lasts about ten minutes. If the volatile pro-



1. Larger Inhaler. 2. Smaller Inhaler.

ducts be too irritating at any time, and excite coughing, the spirit lamp should be removed for a minute, the inhalation being continued, however, in the mean time. The patient learns very soon how to accommodate the process to his tolerance of the vapour, the pungency of which is very slight.

[At the hospital for Consumption, at Brompton, a considerable number of patients have inhaled opium during the last twenty months, and many of them apparently by this means increased in weight, and improved in general health. Dr. Snow thinks morphia the most suitable preparation of opium for inhalation. He says:]

It has been inhaled by one patient, in the dose of half a grain, and I have inhaled it in the same quantity. It is much easier and pleasanter to inhale than the extract of opium, the extractive matter of which supplies some smoke, which is probably quite inert. It is of service to mix the morphia with a little dry plaster of Paris, to give it more weight and bulk.

With respect to the doses just mentioned, it should here be remarked that a medicine, when inhaled, cannot be all absorbed, as usually happens when it is taken into the stomach, for only part of it reaches the lungs, whilst another part is expired again with the air which has occupied the nostrils or mouth, the larynx, trachea, and larger bronchi. I am inclined to believe that about one-half of what is inhaled is usually absorbed; for, on inhaling air charged with vapour of chloroform from a bladder or small balloon, I experienced as much effect from ten minims, when it was breathed backwards and forwards

for a minute or two, as from twenty minims, when the air was only breathed once.

Extract of stramonium has been inhaled in the Brompton Hospital, with more or less relief, by five or six patients affected with asthma. Four grains were used, in the same manner as opium. The spirituous extract of aconite was used also by one patient, in the quantity of a grain; and it is probable that other extracts might be employed with advantage, in the same manner.

*Gum-Resins.*—The fumes given off by these medicines may be inhaled in the same way as opium; but, as these fumes are pungent when in large quantity, it is advisable to powder two or three grains of the gum-resin, and mix it with about ten times as much of some inert powder, as gypsum, before exposing it to heat in the capsule. Used in this way, ammoniacum gives off a very fragrant odour, and, though rather pungent, can be inhaled very well by most persons. With steam the gum-resins can be easily inhaled, as the quantity of vapour which they give off, at the temperature of boiling water, is small. In this way, however the patient gets no great amount of the medicine; but probably enough to exert some local action.

*With Vapour of Water.*—For the inhalation of medicines along with the vapour of water, I employ the above-described inhaler, using a somewhat larger earthenware capsule than for inhalation in the dry way. Into this capsule or dish, about half an ounce of water is put, together with the medicine to be inhaled. The water is heated by the spirit lamp, sometimes till it boils gently, but generally to a point rather short of boiling. This quantity of water yields as much vapour as a patient can conveniently breathe in about half an hour; and a much greater amount of the medicine can generally be inhaled than if it were placed in a larger quantity of water. In the case of some substances, indeed, as iodine, oil of turpentine, and camphor, which are particularly adapted for inhalation in this manner, the medicine is all inhaled before the water is finished.

Iodine may be most conveniently inhaled, by adding a small quantity of a strong spirituous solution of it to half an ounce of water. Twelve minims of the iodine tincture of the *Dublin Pharmacopœia*, containing one grain of iodine, are a suitable dose. The advantage of adding the iodine in the form of tincture is, that it becomes equally diffused through the water. As the patient inhales, the water becomes less and less deep in colour, and by the time that he has inhaled about three-fourths of the water, he has inhaled the whole of the iodine; and the remaining water is colourless. On account of its irritating effects on the stomach, it would probably be advisable that iodine should be given by inhalation, in every case in which its exhibition is required. Allusion is here made only to iodine, and not to the iodide of potassium, which, not being volatile at the heat of boiling water, cannot be inhaled in this manner. I very much doubt whether phthisis be one of the diseases to be benefited by iodine. It was inhaled by eighteen patients at Brompton, in the summer of 1849, and the following autumn and winter; they generally commenced with half a grain, and it was increased, in one or two cases, to two grains, but the usual dose was a grain once a day. In two or three cases it was discontinued, as it seemed to increase the cough, and one or two of the patients complained of head-ache from its use. It was continued, however, for more than a month, in ten of the cases; and I was present on nearly every occasion, to see it inhaled. It may consequently be said to have had a fair trial; but no benefit could be observed to follow its use. It was not inhaled as above recommended, but from a Woulfe's bottle, over the interior of which its spirituous solution was diffused: no artificial heat nor vapour of water was employed; the inhalation was continued till the iodine had disappeared. There were consequently no extraneous circumstances to interfere with its action.

Oil of turpentine has been inhaled in a few cases, by putting twenty drops of it, with about half an ounce of water, into the capsule; the spirit lamp being placed underneath, as usual. The boiling point of oil of turpentine is much higher than that of water; but owing to the great density of its vapour, as compared with steam, it evaporates more quickly than water, as happens with iodine. and consequently it is all inhaled before the water is consumed.

The cough has appeared to be relieved in the cases in which it was used. One was a case of hæmoptysis, which subsided under its use, as, however, it might have done without it.

Camphor can be conveniently inhaled by putting thirty or forty drops of the tincture into half an ounce of water. It is usually consumed as soon as the water with which it is mixed. It has appeared to relieve the cough, in a few cases in which it has been used.

Benzoic acid can be inhaled with the vapour of water. If six grains be put into half an ounce of water, the patient will inhale about half of it, and should leave off before the water is quite dried up, to avoid the pungent fumes which would otherwise arise. For the next inhalation, some water and about three grains more of benzoic acid can be added to that which remained. I have not seen sufficient of its employment to speak of its effects.

Creasote may be best inhaled in the same manner. If not more than about four drops be put into the half ounce of water, all of it will be inhaled. I have generally given creasote, however, with the inhaler marked number 2 in the engraving. Several patients have inhaled it at the Brompton Hospital, generally using three or four drops twice a-day. The benefit from its use has not been very great, but might probably have been greater, if it had been inhaled with vapour of water, which itself is serviceable.

*Inhalation of Medicines at the Ordinary Temperature.*—The smaller inhaler, shewn in the engraving, was contrived for the inhalation of chloroform in medical and obstetric cases. It is made of brass tube, rather less than an inch in diameter, and is lined with bibulous paper to absorb what is put in, and afterwards yield it up in the form of vapour as the patient inhales. It is adapted by a screw to a face-piece similar to that employed with the other inhaler. It is not my intention to speak of chloroform on the present occasion. Amongst the other medicines which have been inhaled with it, are hydrocyanic acid and conia; and it is adapted for the inhalation of almost any agent that does not require the application of heat.

Hydrocyanic acid has been inhaled by several patients at the Brompton Hospital, but it has not seemed to produce any good effects which would not have resulted from its use by deglutition. The quantity inhaled was generally twice as much as one would give by the stomach, and it was somewhat diluted with water, to diminish the pungency of the vapour, and enable the nurse to measure the quantity more easily in the minim glass.

Conia, the volatile alkaloid of spotted hemlock, has been inhaled by several patients. Some of this active principle having been kindly given to me by Mr. Morrison, I first tried some doses on myself, and found that a minim of it could be inhaled without inconvenience. This was the quantity usually administered, although two minims were inhaled in a few cases. Dizziness was caused by it in many instances, especially when the larger dose was employed, but this effect subsided in less than an hour. The cough was usually relieved by it, and in two or three cases of asthma, the breathing was also relieved. The conia was diluted with nine parts of spirit, both for convenience in giving the right dose, and in order that it might be better diffused over the paper in the inhaler, and offer a large surface for evaporation.

The following experiment, performed in 1848, on the inhalation of conia, may not be uninteresting, as shewing that this is one of the agents which might be employed for the prevention of pain in operations.

A chaffinch was placed in a covered glass jar, holding 100 cubic inches and one grain of conia was put in. The bird seemed unaffected for ten minutes, and the jar was opened with the intention of trying a larger dose; a minute afterwards, however, it fell on its side and lay, not relaxed, but like a stuffed bird, as its head did not droop. It moved its legs, now and then, by convulsive starts. It was insensible to pricking and pinching, although, from the appearance and motion of its eyes, it seemed to be conscious all the time. It recovered its sensibility in about two minutes, but was not able to stand for ten minutes. It afterwards appeared well.

In a guinea-pig, in which the inhalation was continued till a fatal effect was produced, violent convulsions occurred before death, and the heart remained irritable afterwards.

Ammonia has been inhaled with great relief in a few cases, in which more or less bronchitis, with difficulty of expectoration, existed. The inhaler employed was similar to that described by Mr. Smee in the 'Medical Gazette,' for 1843, except that an elastic tube and face-piece were attached to it. It consists of a Woulfe's bottle with wide apertures, and a tube for the entrance of air. descending a certain way, but *not* dipping into the solution employed. The ammonia was given weaker than by Mr. Smee. Two ounces or so of cold water remained constantly in the bottle; and when it was about to be used, twenty minims of strong solution of ammonia were added, and the patient inhaled for half an hour, or as long as ammonia continued to be given off. The inhalation was repeated twice or three times a day.

It may be remarked, that either ammonia or hydrocyanic acid might be inhaled, along with vapour of water, in the opium-inhaler first described; so that a person provided with it might apply it in almost every kind of inhalation.

Chlorine has been inhaled by a few patients, in different stages of phthisis, but with no advantage, although it was continued by some of them for a few weeks. To obtain it, some chloride of lime was put into the Woulfe's bottle-inhaler, just mentioned, and moistened with a little water. When it was wished to increase the quantity of chlorine beyond the small amount spontaneously given off, the inspiratory valve of the face-piece was prevented from closing completely, and a little of the expired air being thus allowed to get into the bottle, the carbonic acid it contained acted on the lime, and caused chlorine to be liberated.

It will be observed that the medicines mentioned above have all been recommended to be inhaled, either alone, or with the vapour of water: and, as a general rule, it is better for medicines to be inhaled, singly, since no two being equally volatile, they could not be inhaled, if combined, in the proportions in which they might be mixed. The method of administering medicines by inhalation also being yet as it were, in its infancy, the exhibition of one at a time is better adapted for the collection of correct observations respecting their effects.—*London Journal of Medicine, Feb.* 1851. *p.* 122.

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## 186.—DUTCH LIQUID AS A LOCAL ANÆSTHEMIC.

M. Aran has recently communicated to the Academy of Medicine in Paris a paper on Local Anæsthesia. The following are his conclusions, given in the 'Gazette Médicale de Paris' for 23rd November, 1850.

1. All general anæsthetics (the ethers, chloroform, Dutch liquid, aldehyde, benzine, &c.) possess also the property of including local anæsthesia.

2. The energy of the local anæsthetic power is in an inverse relation to the volatility of the substance. This explains why Dutch liquid is superior, as a local anæsthetic, to all others, why chloroform is better than ether, and acetic ether better than the other ethers.

3. Some anæsthetics, as the ethers aldehyde, and benzine, produce no irritation when applied to the skin; others, again, are more or less irritating. Chloroform produces, in small quantity, a burning sensation, and may even produce vesication, if the quantity be greater, and contact more prolonged. Dutch liquid is irritant; but infinitely less so than chloroform.

4. The local anæsthetic action of Dutch liquid continues longer than that of other substances, even when only from fifteen to thirty drops are applied to a painful part. It only produces slight stimulation, and has a slight ethereal odour, more agreeable than that of the ethers, aldehyde, or benzine.

5. To obtain local anæsthesia, from fiteen to thirty drops are to be dropped on the painful part, and the whole covered with a wet compress and a piece of waxed cloth (or oiled silk). This succeeds in most cases, where local anæsthesia is indicated.—*London Journal of Medicine, March*, 1851, *p.* 269.

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## 187.—A NEWLY RECOGNISED PRINCIPLE IN THE INDUCTION OF ANÆTHESIA, AND A NEW ANÆSTHETIC AGENT.

By Dr. T. Cattell, Braunston.

[Dr. Cattell thinks he is right in deducing the following principle with regard to the use of anæsthetics—That no anæsthetic agent should be allowed

ingress to the lungs of a higher specific gravity than the air we breathe—which he believes will offer a greater safeguard against the occurrence of dangerous and anomalous symptoms than any yet propounded. To carry this into effect, an apparatus is necessary, which will permit the specific gravity of the vapour being lowered to the standard in question and uniformly maintained during the process of inhalation, and which will allow of such vapour being inhaled directly intermixed with a given proportion of free oxygen, or in connection with another compartment containing it.]—*Lancet, Dec. 7*, 1850, *p.* 628.

## 188.—LOCAL ANÆSTHETIC MEDICATION.

Dr. Aran, member of the Central Board for Hospitals, addressed a note on the value of various anæsthetic agents in reference to local medication. The following are the chief of Dr. Aran's conclusions:—

1. All those volatile agents that are recognised as general anæsthetics possess the same property when applied locally.

2. This local power is not in direct relation to their general anæsthetic powers, but is in an inverse ratio to their volatility. Thus the Dutch liquid, or chloride of olefiant gas, exceeds all others; chloroform excels ether, &c., &c.

3. Some of these agents do not produce any irritation of the skin—*e. g.*, ethers, aldehyde, and benzine—while others, as chloroform and Dutch liquid, cause a sense of burning, and, if applied long enough, produce vesication.

4. Therefore the Dutch liquid is the best local anæsthetic agent: its action endures a longer time, it produces only slight stimulation of the surface, and has a less disagreeable odour than the ethers, &c

5. It is not necessary to employ large quantities for obtaining these local effects: from fifteen to thirty drops of the chloride of olefiant gas, covered with a moist compress, will suffice to allay pain in most cases.—*Med. Gazette, Dec.* 6, 1850, *p.* 986.

## 189.—THE MODE OF ORIGIN AND PROPAGATION OF THE EPIDEMIC CHOLERA,

IN HUDDERSFIELD AND THE NEIGHBOURHOOD, IN THE AUTUMN OF 1849.

By Dr. John Taylor, Physician to the Huddersfield Infirmary.

[Dr. Taylor examines all the cases occurring in these districts, to find if they contribute anything towards the elucidation of the mode of origin and propagation of cholera.]

I. *Origin of the disease.*—The cases which I have given occurred in *thirty-seven* distinct places. In *thirty* of these places the disease did not arise from any known source of contagion. The following are the names of the places: Colne Bridge, Quay-street, Lowerhead-row, Union-row, Fenton-square, Stock's-buildings, Cliff-end, Lindley, Fartown, Paddock, Clough near Paddock, Johnny Moore-hill, Brierley Mill, Thomas-street, Cross Church-street, Lane, Ash Brow, Dead Waters, Swallow-street, Rashcliffe, Hill-house, Old Post-office-yard, Cropper's-row, Dyke-end lane, Old-street, Slaithwaite, Greenside, Milnsbridge, Lime-kilns, Cresland Moor.

If this statement requires any modification it is in respect to Quay-street (Case 4), Lindley (Case 10), and Cropper's-row (Case 64).

In the remaining *seven* places, the disease showed itself in persons coming from an infected district. In only *one* of the seven places did more than one case of cholera occur (viz., Castle-gate), and in this instance there was no known communication between the first patient and the one or two subsequent ones. The disease does not seem to have spread, therefore, in a single instance. It is probable that in each of these seven instances the patient acquired the disease in an infected locality, and moved to the place in which the disease broke out during the period of incubation. The following are the names of the seven places:—Vagrant Office Huddersfield; Bradley Mills, Mold Green, Castle-gate, South-parade, Meltham, Huddersfield Prison.

The disease broke out nearly at the same time in distinct points, at considerable distances from each other, and under circumstances which make it appear in the highest degree improbable that it could have been conveyed from one place to another.

From these facts it seems fair to conclude that the cholera did not arise by contagion in any, perhaps, of the thirty places first mentioned; and that it is impossible to suppose that it could have sprung from contagion in all the thirty places.

II. *Propagation of Cholera.*—1.—We have just seen that, in seven places, the first person attacked had come from an infected district, yet the disease did not spread in any one of these instances. The particulars have been given of the removal of a family under circumstances highly favouring the spread of a contagious disease, yet without any such effect having followed.

2.—In fifteen out of thirty-seven places in which the cholera was observed, more cases than one occurred in each place.

In two of these fifteen places (Lindley and Dead Waters) all the cases occurred in the same house. In these places, therefore, it is difficult to judge whether the disease was propagated by contagion, or whether all the cases arose from the same source.

In the thirteen remaining places the cases occurred in more houses than one. Under what circumstances did the disease occur in a second or a third house, after it had appeared in the first one, in these thirteen places?

In two of them it may be regarded as certain that there was no communication between the houses first and those afterwards affected. (Paddock and Slaithwaite.)

In nine of them there was very probably no communication. (Quay-street, Union-street-lane, Swallow-street, Castle-gate, Rashcliffe, Clough, Cropper's-row (?))

In two of them there was communication between some houses, and none, probably, between others. (Cliff-end, Johnny Moore-hill.)

In two cases (Nos. 63 and 54) the disease was undoubtedly contracted by visiting an infected place. But whether it was acquired by contagion, or by exposure to certain local influences, independently of contagion, it is not easy to determine. Another case, (Mrs. Brooke's, described at page 341), in which a person, having left home at Johnny Moore-hill, for fear of cholera, returned to it after a time, and was taken ill before holding any communication with her neighbours, would point to the inference, that the disease was acquired from the place rather than from the people. But there is room for doubt whether the illness in this case was an effect of the choleraic poison.

Thus a careful analysis of the cases leads me to the conclusion that in some of them the disease *certainly* was not propagated by contagion, and that it *probably* was not in most of them. In others, again, it *may* have been, and in a few it is not improbable (although it is by no means certain) that it was propagated by contagion.

If cholera were propagated exclusively by contagion, the poison must be the most virulent, and the most certain in its operation of any of the contagious poisons known to us. Small-pox, measles, and scarlet fever, of all contagious febrile diseases, are perhaps those which are the most certain to be communicated to exposed persons who have not already suffered from them. But these diseases are never observed to spread with a rapidity which admits of an instant's comparison with that of cholera. In the case of cholera, one house is affected to-day, two or three others, near or distant, to-morrow, and as many more each succeeding day, until a whole neighbourhood has been devastated within a period of time that would barely suffice for the propagation of any other contagious fever from one patient to half a dozen more. If the contagion of cholera were so virulent as this opinion supposes, comparatively few persons visiting an infected district could hope to escape the disease; and persons removing from an infected place would *generally* become the centres of a fresh circle of cases, whereas, in this district, the diseases never spread from such persons. Washerwomen, and those employed in attending to the dead, would almost always suffer; yet, in the few cases in which I have had the opportunity of inquiring, these persons do not appear to have suffered at all, except when they were at the same time exposed to the other supposed causes of the disease.

Again, diarrhœa accompanied the cholera in such a manner as to lead almost inevitably to the conclusion, that both diseases depended upon the ope-

tion of the same poison. In one class of persons, and under one class of circumstances, diarrhœa resulted; in another class, or under other circumstances, cholera. Diarrhœa began to be epidemic a little before, and ceased to be so a little after the cholera. It prevailed to an extent to which, I believe, it is never observed to prevail, except when in conjunction with cholera. Both diseases visited the same places to a great extent. In some houses, villages, and towns, one of these diseases; in others both, occurred. But very few places altogether escaped both. Within a few days after the appearance of the epidemic in a neighbourhood, it often happened that a great majority of the houses had been visited either by diarrhœa or by cholera. It is not possible to suppose that diarrhœa, when observed under such circumstances, could be propagated to any material extent by contagion; and, if this statement be true of the diarrhœa, it can be scarcely be less true of the cholera.

2. *Endemic Influences*.—Having arrived at the conclusion, that the epidemic cholera neither arose nor was propagated, exclusively, nor even to a very material extent, by contagion, I proceed now to inquire what influence was exercised in the production of the disease by causes of a local character.

In *all* the cases in which I have had an opportunity of making the inquiry, (and that is in nearly all of them,) some of the local causes, whose influence is now generally recognized, were found to exist. Many of the places in which the cholera broke out, and all those in which it prevailed to any extent, were previously well known for their unhealthiness, and have been noted for their liability to fever and other epidemic diseases. The following circumstances, either singly or in various combinations, are those which have been chiefly remarked in the places visited by the epidemic:—

1. The accumulation of filth of various kinds, foul privies, bad drains, or the absence of drains and want of personal cleanliness.

The good effects of cleanliness are strikingly exhibited by the fact, that only one house at Johnny Moore-hill was free from both diarrhœa and cholera, and that the occupants of that house were distinguished from their neighbours by their superior cleanliness.

2. Overcrowded dwellings and bad ventilation. The bad effects of these circumstances were especially seen at Johnny Moore-hill, where they were observed in almost every house, and where the disease prevailed most in the most crowded houses. The good effects of removing from such places are noticed at p. 342.

3. A number of the cases occurred in low situations, and near to a river or canal.

The disease broke out in a very severe form, but did not prevail extensively, in several elevated and very airy situations. (Cliff-end, Lindley, Clough near Paddock, and even Johnny Moore-hill.) In all these instances, the ordinary local causes were present in a high degree, and seem to have operated injuriously, in spite of the beneficial influence of an otherwise pure air.

4. There were abundant materials for the production of malaria in several places, *e. g.*, the old fish-pond near to Paddock and Cliff end; also at Dead Waters, a marshy locality, as the name indicates. It has been stated that, before the cholera appeared at Johnny Moore-hill, the wind blew from the fish-pond towards the dwellings. After this time the wind was generally easterly, and it is possible this circumstance may have had something to do with the immunity of the general village of Paddock, and with the spread of the disease to several places west of Paddock, as Milnsbridge and Slaithwaite.

5. The condition of the water was inquired into in most places. There was no reason to suppose that it was contaminated in any instance, unless in the case of two families, who had used the water in the old fish-pond in July and August.

The influence of the local causes just enumerated appears to have been increased by the personal state or habits of various individuals. Such are—

1. *Intemperate Habits*.—These are noticed in several cases, and certainly existed in many more.

2. One patient was attacked soon after eating cucumbers and fat meat.

3. *Previous Liability to Diarrhœa*.—In cases ten and forty-one this is men-

tioned. In one instance, however, an individual subject to diarrhœa, and exposed to the cholera, escaped all further illness.

In one case the disease came on after purgative medicine had been taken, the patient being exposed at the same time to all the other causes of cholera.

4. Fatigue, poor food, and exposure to cold and wet, seem to have exercised considerable influence in case 1.

5. Great fear of the cholera preceded its appearance in several cases.

6. *Adult age* appears to have been a predisposing cause.

Thus, in this neighbourhood the disease visited those places only in which one or more of the local influences just referred to were to be found. The same statement, with comparatively few exceptions, is equally applicable to the country at large. We are forced, therefore, to the conclusion, that these local influences are intimately connected with, and that in most, although not in all cases, they may even be said to be necessary to the development of the disease.

In this fact is probably to be found the explanation of another, viz.: that the villages near the town were more severely visited by cholera than the town of Huddersfield itself. The hygienic condition of many of the villages is worse than that of the town. In the epidemic of 1832 not more than one or two cases of cholera occurred in Huddersfield; and I have not heard that any more were seen in the neighbourhood. A large part of the town stands upon a gentle declivity. Its position offers natural facilities for drainage; and the elevation and the arrangement of the streets render it more likely to be well ventilated by the frequent high winds than are many other towns. In 1832 active preventive measures were very generally adopted, under the apprehension of a visit from the epidemic; and these, no doubt, contributed largely to the immunity which the district at that time enjoyed. Since then the rapid increase in the population has led to a multiplication of local nuisances; and the usual consequences of these would probably have been experienced in a more severe visitation from the last epidemic, had it not been for the efforts of the Commissioners not long before appointed under a new improvement act. These gentlemen, with an enlightened appreciation of their duties, and in the face of opposition raised on account of the expense, caused many of the worst nuisances to be removed long before the cholera came among us. The jurisdiction of the Commissioners does not extend to those smaller places which were most severely visited, and which, instead of the moderate outlay occasioned by sanitary improvements, have now to bear the far heavier and permanent expense of maintaining the widows and orphans of those who have been prematurely cut off.

One of the most remarkable singularities of the epidemic cholera is this; that after attacking one, two, or three persons in a bad locality, it will cease there. Again, it will altogether pass by other neighbouring spots, as bad or worse than the one visited. One house will be invaded, whilst others much nearer to the nuisance, supposed to be concerned in the production of the disease, will escape. (See remarks on the cases at Lindley, at Fountain street, and at Cliff-end.) Upon any hypothesis respecting the origin of cholera, I can only suggest one explanation of these facts, viz: that of a number of persons exposed in an infected place, some are but little or not at all susceptible of the disease; some are exposed to the poison during a shorter period of time, or in a greater state of dilution: others escape it altogether, from changes in the wind, &c.; and the rest are attacked, some with cholera, some with diarrhœa or dysentery, and others with cramps, pains in the bowels, indigestion, and other forms of indisposition.

3. *Atmospheric Peculiarities.*—But will air, rendered impure by emanations from filth and foul drains, and by want of ventilation, of itself explain the origin and propagation of cholera? I believe it will not; for all these sources of impurity have existed all over the country, and in a greater degree than they now do, for years before the epidemic cholera appeared. If this cause were an adequate one, I do not see why the disease should not revisit us every year.

We are forced, then, I think, to adopt the hypothesis that, in addition to lo-

cal nuisances, and probably also to contagion, there must be some peculiar condition of the atmosphere. That remarkable and unusual atmospheric phenomena of various kinds were observed in many places, is a matter of fact, and has been recorded in several publications upon the disease. The precise nature of these changes remains yet to be ascertained.

Upon this hypothesis we can explain most of the circumstances attending the origin and propagation of the cholera; its simultaneous eruption in separate and distant spots in the same neighbourhood; the escape of other individuals or places apparently equally exposed; the very rapid diffusion of the disease (like influenza) in the same town and over large districts, or even over a whole country; the occasional eruption of it in ships at sea, and also its progress from one country to other and distant countries. When the poisoned atmosphere passes over a town or village, it operates principally upon those who inhabit the worst places, either because its noxious effects are increased by the local atmospheric impurities, (which is probably the principal reason,) or because the persons who inhabit such places, from being less favorably situated in respect to food, clothing, habits, and mental condition, are more liable than others to suffer from any cause of disease applied to them.

The facts I have stated render it impossible for me to believe that cholera was *commonly* propagated by contagion in this district: but I by no means deny, as I have already intimated, that it may have been so propagated in some instances. Many cases, moreover, have been published, upon the authority of trustworthy observers in other places, which seem to prove the contagiousness of the disease. There seems to be nothing to forbid the supposition, that a disease which arose from local impurities or from atmospheric influences may afterwards spread by contagion. Typhus, small pox, measles, &c., must, in the first instance, have arisen without contagion, yet it is certain they are now propagated by contagion. Why may not the causes which *first* produced these diseases, frequently *reproduce* them now? Is it not probable, in fact, that they do? If so may not the same thing occur in the case of cholera? I will only add, in conclusion, that I have collected the *facts* that I have recorded with much care, and have endeavored to reason upon them without any bias. Before I analyzed these facts, I had never formed, nor ever expressed, any opinion respecting the mode of origin and propagation of the cholera. The opinion I have now formed and expressed has been suggested to me solely by my own personal inquiries.

*Period of Incubation.*—When the cholera has been acquired in a particular place, whether through contagion or other local influences, it is desirable, when possible, to determine the period of incubation of the poison. In most of my cases it is not possible to do this, because the patients lived amongst, and so had been long exposed to, the nuisances which probably had a share in producing the disease. Three cases, however, afford more precise information upon this point. In case 37 the disease broke out within three days of the time when the patient first visited the spot at which he must have imbibed the poison. In case 36 the disease broke out in about three and a half days, or eighty-four hours after the first exposure. In case 21 the patient, a child, left an infected place, and was not attacked until ten or eleven days after, having removed to a spot where there was no other case of cholera either before or after.

*Treatment. Mortality, &c.*—There is nothing deserving of remark in the treatment of the cholera at Huddersfield. Various plans were tried by various practitioners, but the cases were too few in number to admit of any plan being tested upon a large scale. The mortality did not differ materially from that observed in many other places. The deaths were thirty-nine, the recoveries fifty-four. These numbers are given only because a widely different account has been published.

The treatment of the premonitory diarrhœa was very generally successful; and, by adopting the plan of house-to-house visitation, many such cases were discovered and stopped, and no doubt many lives were saved.

My experience of the last epidemic would lead me, in the event of another such visitation, to urge the great importance of house-to-house visitation, with

a view to the discovery and treatment of all cases in the early and still manageable stages; the removal of the healthy from infected and over-crowded houses to places of refuge in proper situations; and clearing away all of nuisances; lime-washing the houses, and other similar measures.

The most beneficial measures, however, are those sanitary improvements which can only be carried out at leisure, and when no epidemic is pressing upon us. By these means, no doubt the cholera, and also, many other diseases, might be, to a great extent, prevented, and much suffering and many lives might be spared. The want of proper persons, possessing the requisite authority to undertake this duty, in some cases, and a mistaken view of the expense in others, have hitherto prevented it from being discharged in a manner adequate to meet existing evils. The great fact, established upon most ample evidence, that it costs very much less to remove nuisances, and thereby to prevent disease, than to maintain the families of disabled men, and to make provision for their widows and orphans, is not yet sufficiently known to, or is not properly appreciated by, the local authorities of most towns and villages. The result is that, in this district as elsewhere, if cholera returned to-morrow, it would find us unprepared to stay it progress. The places that were cleansed have generally relapsed into their former filthy condition, and would afford all the facilities for the development and spread of the disease which they unhappily supplied during the last epidemic. It is to be hoped that the Huddersfield Improvement Commissioners, who have shown that they understand what is required of them, will not be prevented from doing it effectually within the limits of their jurisdiction, by any short-sighted outcry against the necessary expenditure.

Nearly the whole of the preceding report was written in December, 1849, and January 1850. Since it was completed, the Report of the General Board of Health, already referred to, has been published. The results arrived at are the same in every important particular. The inquiries were totally unconnected with each other.—*Med. Times, April* 12, 1851, *p.* 399.

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## 190.—THE CHOLERA—WHAT HAS IT TAUGHT US?

By W. J. Cox, Esq.

[In a pamphlet, of which Mr. Cox is the author, he gives the result of ninety cases of cholera, treated by five different methods, so that we can at once recognise and compare the value of each of the different modes adopted. With regard to his views of the nature of malignant cholera, the conclusions he arrives at are as follow:]

"2. That the cholera virus acts primarily upon the lining mucous membrane of the intestinal canal (chiefly the arch of the colon and lower part of the ileum), producing at first a high degree of irritation, and afterwards a *specific* inflammation rapidly tending to disorganization. This is proved, I think, by the condition of the villous coat discovered in those who die early in the collapse.

"4. As a consequence of this excessive energy of the sympathetic ganglionic centres, the intestinal canal becomes highly positive, rapid decomposition of the tissues takes place, and great increase of temperature occurs, arising necessarily from the unwonted activity of the chemical processes of oxidation and destruction. Congestion and semi-paralysis of the contiguous viscera (liver, hepatic ducts, spleen, kidney, &c., but especially the two first mentioned) soon happens, and, becoming severe and persistent, ends in—

"5. Paralysis, partial, or, in rapidly fatal cases, often complete, of the mesocephalon, medulla oblongata, and upper part of the medulla spinalis, caused directly by the carbonized blood circulating through the nervous centres.

"10. Where the collapse is survived, the greatest danger after reaction is established consists of the lighting-up of gastritis and encephalitis, terminating in ulceration of the stomach and effusion beneath the arachnoid.

"11. That cholera has a manifest and remarkable tendency to a periodical return of the accession of its symptoms. Patients frequently recover from the first shock of collapse, which generally sets in at night; reaction becomes well

established during the day, to be succeeded by a fresh attack of the worst symptoms of prostration after sunset. This periodicity is noticed, more or less, in all febrile affections.

"12. That the disease is certainly contagious; I will venture to say, from my own limited experience, it is more contagious than continued fever."

From these views of the nature of cholera, Mr. Cox has deduced the subjoined method of treatment, which he has found more successful than any other yet proposed:—

"To sum up, then, the list of remedies, I think we are warranted in concluding are the most worthy of trust, as being the most rational, and in practice successful. The order of precedence in which they are placed indicates what I conceive to be their relative merit. They should, however, be used simultaneously. We are not, I think, justified in trusting alone to any one remedy when we have to cope with so terrible an enemy but should use the combined force of all such auxiliaries as have stood the test of experience. 1. CALOMEL: in 'small and repeated doses,' as recommended by Dr. Ayre, except in such instances wherein, as before stated, violent cramp is present, when it seems preferable to exhibit it in larger doses. [See the report of my own cases.] The only modifications I have adopted and ventured to suggest in Dr. Ayre's mode of administering this grand remedy, are—*first*, to give it in the form of powder instead of in pills, for its action is more rapid when so administered: *Secondly*, to give it alone, or at all events not in combination with opium. Dr. Ayre, I believe, now concedes this point. 2. ICE: externally to the abdominal region, and also by mouth. 3. SPONGING with very dilute nitro-hydrochloric acid. 4. SULPHURIC ACID. 5. MERCURIAL INUNCTION of the right hypocondrium. (Strong blue ointment, half an ounce to an ounce, repeated in two hours if deemed necessary). Of this list, No. 1. *is certainly, I boldly say, A* 1. I shall presently adduce statistical evidence of their actual value, as well as of their relative value, when compared with other remedies.

Some space is devoted to answering the objections urged against the calomel treatment; but this, in our opinion, is quite unnecessary. If the author's experience has shown him that, by adopting it under similar circumstances, there have been fewer deaths than when the patients were treated on any other plan, this is *pro tanto* a conclusive answer to all objections. We care not what the *theoretical* operation of a remedy may be, provided it be proved to be a *bona fide* remedy; and in this respect we think there has been much profitless choleraic discussion. The little that we know, physically speaking, of the *modus operandi* of any one drug in the Materia Medica on the organic tissues should satisfy us that a remedy may have an empirical character, and yet be highly serviceable in the hands of a skilful practitioner.

Mr. Cox informs us that the calomel treatment was adopted by Dr. Ayre, in 1832, in 219 cases, and there were forty-three deaths: in 1849 it was used by him and his colleagues in 3764 cases, and there were 371 deaths. The mortality of cholera in the cases thus treated, amounted to about twelve or thirteen per cent. In the practice of Dr. Wilson of Sheffield, the deaths under the same plan of treatment were not more than twenty per cent.: and, according to Mr. Cox, out of upwards of 900 cases treated on the calomel system in small doses, there were only *seven* deaths,—*i.e.* less than *one* per cent; while the average mortality from cholera varies from *fifty* to *eighty* per cent. Mr. Jones, like Mr. Cox, at first pursued the *saline treatment, and lost every patient!* and afterwards the stimulant and opiate system, which proved nearly as unsuccessful. As the experience of *one* practitioner on the treatment of cholera, the following summary of the results of ninety cases is of value:—

| | Results. | Deaths. |
|---|---|---|
| Cases treated by stimulants and opium . . . . . | 17 ... | 10 |
| Cases treated by stimulants alone . . . . . | 5 ... | 3 |
| Cases treated by tartar emetic . . . . . | 4 ... | 4 |
| Cases treated by large doses of calomel . . . . . | 9 ... | 1 |
| Cases treated on Dr. Ayre's system, modified . . . | 55 ... | 13 |
| Total | 90 ... | 31 |

The subjoined paragraph gives the relative mortality under the "small-dose" calomel system and other methods of treatment:—

"From the reports and statistics I have here adduced, and from all I have been able to learn from numerous authentic sources, I have arrived at the following general ultimate estimate of the relative value of the calomel treatment, viz.—

"Deaths under Dr. Ayre's system, 20 to 24 per cent.

"Deaths under other methods of treatment, *saline*, stimulants, &c., 50 to 70 per cent.

"This, I beg *earnestly* to assure my readers, is not a rough and prejudiced guess, but the conviction resulting from patient inquiry.

Mr. Cox not only points out the plan, which, according to his experience, was most successful, but he plainly denounces other plans which utterly failed in his hands, and appeared even to hasten death. Of the *tartar-emetic* treatment, he says:—

"In my own hands, and under the management also of many of my friends, it proved a *decided and deplorable failure*. I lost *every case*, and those not of an especial malignity of type:—insomuch so, indeed, that nothing would induce me, in the event of a fresh outbreak, again to waste valuable time in giving it a new trial, which, I firmly believe, must prove equally futile."

Of opium we find him expressing the following opinion:—

"The administration of opium must be not only useless, but *manifestly contra-indicated*, as being fraught with great danger. Indeed, I consider this drug TOTALLY INADMISSIBLE in any stage, or in any dose. It is *quite powerless* to check the vomiting and purging, or to relieve the cramps. Moreover, it must, by its well-known influence on that organ, greatly promote the risk of congestion of the brain, to which, and its fatal results, there is naturally a strong tendency when reaction takes place."

In short Mr. Cox regards the board of health specific—opium—as a "poison" in Asiatic cholera. The application of hot mustard poultices, or heat in any form to the abdomen, is also condemned.

"That heat applied in any form to the abdominal parietes must prove injurious, as tending in a great degree to keep up the high action already going on within, and to accelerate and hurry on to still greater rapidity the destructive processes of inflammation and decomposition, * * * I have never witnessed the application of heat to the abdominal region during the collapse of cholera with any other effect than to intensify the condition of prostration, and to increase, or even to re-excite vomiting."

Applications of ice or cold water, either locally or taken by the mouth are, on the contrary, attended with good effects.

We must bestow on Mr. Cox the praise of fairly recording his testimony on the results of five different methods of treating cholera. Experience, thus accumulated, cannot fail to be serviceable to medical science; but at the same time we must take leave to remind the author that there are two sides to the picture. While Mr. Cox regards calomel in small and repeated doses as the sheet-anchor in the treatment of cholera, and opium as *never serviceable* in the diarrhœal or any other stage of the malady, another experienced observer—Dr. Hughes, of Guy's Hospital—equally ardent in the search of truth, and desirous of improving medical practice, with, perhaps, a larger field of experience before him, has arrived at conclusions diametrically opposed to those of Mr. Cox. In an interesting paper, published in this journal, Dr. Hughes states that the results of the small-dose calomel plan were so unfavourable as to produce a mournful depression of his spirits. All, or almost all the patients, so treated, died! He records that the calomel was thus tried in twelve consecutive cases by a friend. *All died*, and died more rapidly than ordinarily, though the patients were of varying ages and in different stages of the complaint. Let our readers compare this with Mr. Jones's (of Wandsworth) mortality of one per cent., and then try and arrive at some conclusion respecting the fallibility of medical observation or experience. No one can doubt the accuracy of the reporters on either side. Hence it follows, on the one hand, either that all the cases were not cases of cholera, and the calomel had noth-

ing to do with recovery or death, or on the other, that the locality in which the calomel is administered must exercise a surprising and an unaccountable influence on the results! In such a conflict of testimony, how are we to arrive at the truth?—*Med. Gazette. Jan.* 17, 1851, *p.* 111.

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## 191.—CHOLERA IN ITS RELATION TO SANITARY MEASURES.

[Before commencing a review of this subject it should be premised that for five years preceding the invasion of cholera, in 1848, there had been a progressive increase in the ratio of zymotic diseases, especially typhus fever, influenza, and diarrhœa, the latter, however, continued its course with the most steady progress. The deaths from this disease in the metropolis, during the five years ending 1848, amounted to 7580: whereas in the preceding five years, there were only 2828. It appears also from statements made, that the epidemic of cholera in 1848-9 was a more fatal one than the preceding visitation of 1832-3. In that of 1832-3 one person in every 250 died, while in that of 1848-9, one died in every 151. With regard to the principal localising conditions and predisposing causes of this virulent and fatal disease, the first to be mentioned is, perhaps, *overcrowding*, for]

Of all the circumstances affecting health, none is so important as the condition of the air that we breathe. On it, more than upon the food we eat, depends the purity of the blood and the right exercise of every function of the body. Hence the special care manifested for the maintenance of the respiratory process in all animals, alike by the admirable structure of the organs which subserve this purpose, and the beautiful arrangements and adaptations of the media in which they live, and the circumstances in which they are placed. In a state of nature all goes on healthily and well. The same air is not breathed a second time until it has been rendered pure as before; for whenever the air has been brought into close proximity with the blood of a living animal, it immediately experiences a change which disqualifies it for healthy respiration. One fifth of the oxygen which it contained—we speak of the function in the human being—disappears, and its place is occupied with a nearly equal volume of carbonic acid. How, then, can the same portion of air be inhaled again without detriment? A determinate amount of oxygen is required, at each act of breathing, to enable the system to get rid of the carbonic acid, which requires to be discharged every moment, and which, if not eliminated as nature intended, acts as a slow poison to the blood. If we take the ordinary computation of twenty cubic inches of air being drawn into the lungs at each inspiration, and of there being about twenty respirations in a minute, then 333 cubic feet, or thirty-three hogsheads, are made use of by each person *per diem*. Not less than between ten and twelve cubic feet of carbonic acid are therefore evolved in the course of the twenty-four hours, a quantity which will be found to contain at least six ounces of solid carbon! The consideration of this fact alone must suffice to show the extreme importance of there being no impediment to the due exercise of the respiratory function, and prepares us at once for the pernicious results that inevitably attend upon the breathing of an atmosphere which does not enable the system to remove its self-generated poison. The retention or inadequate discharge of the carbonic acid,—besides the more direct effects of oppression, loss of appetite, and greatly impaired muscular energy,—renders the body more prone to every form of diseased action, and far less capable of resisting the influence of baneful agencies from without.

But the chemical change in its composition is not the only alteration which respired air has undergone. Besides the large amount of carbonic acid, it has become charged with a watery vapour, which of course renders the atmosphere of unventilated chambers unduly moist—a condition to which we shall afterwards have occasion to allude, as one of the causes favouring the development of epidemic disease. The quantity of fluid exhaled from the lungs, under circumstances of health, is believed to be at least from sixteen to twenty ounces in the course of the four-and-twenty hours. Of course, if the process be imperfectly performed, as it must be liable to be in an atmosphere already

loaded with moisture, nature must seek an outlet for the excretion at some other channel. And let it not be supposed that it is mere aqueous vapour that is thus discharged; there is effluvial animal matter mixed with or dissolved in it,—a matter which, upon being condensed, is found to be of a highly putrescent and rapidly decomposable nature. It is in fact one form of the waste, and therefore excrementitious, products of the system, which are being continually eliminated by the various emunctories of the lungs, skin, bowels, and kidneys: each of these organs having its special task to perform in the great process of excretion and purification, so indispensable to the maintenance of healthy life. That the atmosphere of ill-ventilated rooms, where a number of persons have been congregated for some time, is tainted with this animal effluvium, is obvious from the peculiar sickening smell perceived on entering a crowded dormitory in the morning before the doors and windows have been opened, or even a large school-room after children have been in for several hours; unless, indeed, there has been—as ought always to be—a thorough and continual circulation of pure air. Medical men and others, after visiting the wretched abodes of the poor, often retain for several days in their clothes, the offensive smell of such localities;—how, then, must the bedding and furniture of such apartments, as well as the garments of the inmates, be impregnated with it! It clings to the very floors and walls of the rooms; and these, moreover, from the vicious construction of the windows—being seldom or ever made to open from the top—can scarcely be kept quite sweet, even under the favourable circumstances of non-crowding and cleanliness. The pollution of the atmosphere from the cause now mentioned, viz.: the existence of a noxious organic matter in it, is probably a more influential cause in generating certain forms of disease, and in powerfully predisposing to the invasion of epidemic disorders, than even the vitiation of it from an excess of carbonic acid. It is necessary, however, to keep both in view, as well as the increased amount of aqueous vapour in estimating the baneful effects of deficient ventilation in the dwellings of the poor. But the lungs are absorbing as well as excreting organs; they are as ready to take in, as they are active in giving out. The blood is permeating every part of these with such rapidity, that the entire mass of it is believed to circulate through them, and to be consequently exposed to the air contained in their minutely-divided cells, in little more than three minutes. How favourable, then, is such an arrangement, coupled too with the exquisitely delicate fabric of the pulmonic tissue, to the imbibition or absorption of all volatile matters in the respired air, and their immediate transmission to every part of the body! There cannot surely be a reasonable doubt, that not only are the special morbific poisons generally received into the system in this way, but that also the gaseous products of animal and vegetable decomposition, and the effluvia given off from living bodies, are apt to be drawn into the circulation by the lungs, and serve to vitiate the blood—more or less rapidly and powerfully, according to age, vigour of constitution, and other accessory causes—and to deteriorate the health. The general effect of the absorption of such matters is to lower, in a very marked degree, the physical energies of the system, rendering it at the same time much more irritable and less enduring of fatigue: while the more special result is to induce a tendency to diarrhœa and other disorders of the bowels, a proneness to fever and inflammations of a typhoid type, and, as might be expected, a peculiar liability to all epidemic disorders.

One of the most striking illustrations of the effects of *overcrowding* on choleraic invasion, is that afforded by what took place at Taunton in November, towards the close of the epidemic The town which contains about 16,000 inhabitants, although like every other place in the kingdom, very faulty in its sanitary arrangements, is better than most; and, with the exception of a good deal of diarrhœa, had remained tolerably healthy. Suddenly a violent attack of the pestilence took place among the inmates of the workhouse; diarrhœa had existed for some time among them. The first case of cholera occurred on the 3d of November; and in ten minutes from the time of seizure, the patient was in a state of hopeless collapse. Within the next forty-eight hours, no fewer than forty-two cases and nineteen deaths had taken place; and in the

course of one short week, out of 276 inmates, sixty, or nearly twenty-two per cent., were swept away, and nearly all the survivors suffered to a greater or less degree from cholera or diarrhœa. The greatest mortality occurred among the girls; for out of sixty-seven one half were attacked, and as many as twenty-five died. Ten deaths occurred among the boys, and the rest among the older inmates. Now what was the condition of the workhouse? It is described by Dr. Sutherland as being low, badly drained, and most imperfectly ventilated; there were numerous nuisances within the walls; the people had insufficient space allowed them, and personal cleanliness was very much neglected. The medical officer had repeatedly called the attention of the Board of Guardians to the defective arrangements of the house, in consequence of the amount of disease among the inmates, but without effect. "It is very subject," to use his own words, "to epidemics, to measles, to scarlet fever, typhus, diarrhœa constant (especially in children), dysentery, scurvy." He complained much of the closeness and offensiveness of the ward at night, and considered that the space allowed each inmate was not above two thirds of what was requisite for safety. So much for the general condition of the house. But how came it that the stress of the attack fell upon the girls' school-room?—was there any peculiarity in its condition? Dr. Sutherland tells us that—

"The greatest degree of overcrowding existed in the girls' school-room, which was a slated shed, fifteen feet long, nine feet ten inches broad, and seven feet nine inches high to the top of the walls, over which was a sloping roof. In this miserable place were huddled together sixty-seven children, with about sixty-eight cubic feet of air to each."

And this, too, during a season of epidemic sickliness, and when the premonitory disease was actually prevalent in the house! A curious circumstance, that well deserves notice, occurred with respect to the boys' school. This apartment was even somewhat worse than that of the girls; but the boys, finding doubtless the air to be so close, could not be kept from breaking the windows. "Mr. Smith, the chaplain of the workhouse, stated his firm belief that it was to the better ventilation which the broken windows maintained, that the children, in some measure, owed their lives."

While the pestilence was raging in the workhouse, and the inhabitants of the town were suffering a good deal with bowel complaints, although no actual case of cholera occurred among them, it is a very remarkable and most instructive fact, that *not a solitary case even of diarrhœa occurred among the prisoners of the gaol*. The prisoners were much better cared for than the poor inmates of the union. Each cell contained from 800 to 900 cubic feet and upwards of air, besides being systematically ventilated and warmed, to maintain an even temperature throughout the twenty-four hours. Moreover, each prisoner had the means of personal cleanliness, and attention to this was strictly enforced throughout the building. The result was that the health of the prisoners remained throughout perfectly good. "Opportunities rarely occur," remarks Dr. Sutherland, "such as those afforded by the instance before us, of testing the truth of the principles of preventive science."

[As an example of overcrowding, the Tooting case may be taken. In this establishment 1400 pauper children lodged, with little attention to sanitary arrangements. The crowds were so great in the dormitories, that each boy had only 150 cubic feet of air, and each girl 133 cubic feet, for respiration. The consequence was, though the epidemic had not appeared in the neighbourhood, 300 of these inmates were stricken with the pestilence, and out of these 180 died. The girls suffered more severely than the boys. Mr. Granger, in his elaborate report of this case to the Board of Health, concludes as follows:]

"After maturely considering all the circumstances connected with the painful occurrence, I am induced to express my firm conviction, that the essential cause of all the mischief has been the inordinate overcrowding of the establishment. Dangerous as I conceive the effluvia from the foul sewers and stagnant ditches to be, yet, diluted as they were by the winds, they might not alone have been sufficient to produce this outbreak, as may be presumed by the immunity up to this time of the inmates of other houses near these moats and ponds. But the state of overcrowding was such as must have lowered the

health of the inmates in ordinary times, and was almost certain to produce disease under the depressing influence of an epidemic condition of the atmosphere. Without doubt, both the noxious effluvia and the overcrowding contributed to this calamitous result: but of these two causes I attach the utmost importance to the overcrowding, which, on any site, when carried to such an extent as will be immediately shown to have prevailed in this establishment, must have lowered the health of the inmates and predisposed them to disease."

[Mr. Grainger states, as the result of his observations, that the epidemic raged with the greatest violence where the wards were most crowded and most defective in proper aeration.]

But the crowding in workhouses and similar institutions never reaches that degree, which is unfortunately but very common in the dwellings of the poor, and especially in the low lodging-houses in our large towns. It is no unfrequent thing to find two, three, and four families living in one room, which does not exceed ten or twelve feet square. Occasionally the accumulation is much greater than this. In the report of the Whitechapel Association, just published, we read of thirty-seven human beings, men, women, and children, being crammed into a room ten and a half by thirteen feet; the majority of them were nearly naked and very filthy. What a scene of horror! The inevitable pollution of the air under such circumstances is, of course, extreme: and it is only wonderful that life is not more frequently extinguished by suffocation. The amount of sickness, however, is truly dreadful. When a single case of febrile disease occurs in this corrupted and corrupting atmosphere,—not air, but putrid vapour, as some one has called it,—the morbific fermentation (zymosis) proceeds with extreme rapidity, and the ravages of death are often quite appalling, if the residents are not at once removed into a purer locality.

Some severe invasions of the disease took place in such places at an early period of the epidemic, while the adjacent neighborhoods were as yet quite intact. Thus in Jenning's Buildings, a low Irish nest in the healthy suburb of Kensington, there was a very fatal attack of the pestilence in the beginning of 1849; and about the same time, a similar occurrence took place in two of the lodging-houses of the Mint of Southwark. "The beds," says Mr. Grainger, were placed in every possible direction, occupying not only the rooms but the landings on the stairs and passages; the people were huddled together two, three, or more in a single bed, children occupying the foot and the adults the top of the same bed. Some of the houses I examined professed to receive 100 lodgers, others sixty. All this causes an oppressiveness and stench utterly insupportable to strangers," and inevitably productive of disease.

It is in such dens, that the cholera made almost invariably the most dreadful devastations; and as actual narratives always leaves a more lively and lasting impression than any general description, we shall give one instance out of many which might be quoted of such a catastrophe. It occurred at Plymouth, in a locality that has long been notorious for its being the abode of sickness and vice. The situation itself is by no means hemmed in, nor are the houses packed together as in the dense parts of our large towns; indeed Quarry Court, where the greatest mortality occurred, is open in a measure to the fields. The dreadful evil was the overcrowding in rooms which had no means of ventilation.

"One room, where sixteen persons dwelt, was only eight feet four inches square; while another, where nineteen persons ate, drank, and slept, was only eleven feet by nine." In the former instance, each person had scarcely forty cubic feet of air allowed for respiration! This is even worse than in the worst parts of that sink of misery and hotbed of disease, Church Lane, St. Giles', where—according to the report of the Statistical Society, published two or three years ago—the smallest space to one person was fifty-two cubic feet, the average being 175. The particulars are detailed by Dr. Roe, who was so actively and honourably engaged during the whole time that the epidemic continued in the town, and are contained in a series of excellent papers now publishing in the 'Medical Times':—

"On the night of July 9th the great outbreak in Stonehouse Lane took place, and between that time and the 17th there were sixty-four deaths in a

circle, the diameter of which did not exceed eighty yards. The inhabitants of that dismal place were chiefly Irish, of the lowest and most degraded class, herded together like cattle, ragged, half naked, and inconceivably filthy; dead to all proper feeling, even the scenes around them made no good impression, for they stole the spirits and everything they could lay their hands on, even the blankets from off the dying. Situated as they were in small, close, and overcrowded rooms, it was impossible to afford the assistance their necessities demanded, and the difficulty was increased by the determination of the living to retain the dead, sometimes until long after decomposition had been established, for the sad but noisy obsequies of their country and religion. . . . Of one family, consisting of nine persons, four died; and in another house a whole family, root and branch, was swept away. The dead and the dying lay together in one small room, which was in so horrible a condition, that when the bodies were removed, the only way it could be cleansed was by introducing the hose of a fire engine through the windows, and washing all down stairs . . . . . The consternation among all classes, when the facts were made public, was such, that not only none in the town would receive those who desired to fly from the infected place, but when the attempt was made, the fugitives were, if discovered, driven back to the scenes of death whence they had in vain endeavoured to escape. This feeling was manifested even in those parts of Stonehouse Lane which the cholera had not yet invaded, and where the proprietor of a lodging-house was threatened to have his house torn down about him if he did not turn out two poor creatures who had hastened from the pestilence, and sought shelter with him; reluctantly he complied, and "I saw them," says Dr. Roe, "hooted back to the plague spot whence they came."

Numerous and conclusive observations on the effects of overcrowding, in exciting a virulent development of the choleraic poison, might be quoted from the writings of our East India practitioners. Mr. Kellie, for example, the author of a most interesting paper published in Mr. Rogers' 'Reports,' noticed in our Number for January, 1849, says:—

"The disease commits its greatest ravages in crowded ill-ventilated barracks, bazaars, densely-populated towns,—particularly such as are surrounded by walls preventing the ingression of pure air, and in that portion of them where carbonic acid gas (?) is by the decomposition of animal and vegetable refuse being evolved,—crowded school-rooms, the inhabitants of a portion of a barrack in the vicinity of an open drain: native huts, into which there is but one opening, and that closed at night; whole families are frequently swept away from their exposure to this exciting cause."

Wherever large assemblages of people, for example, at native festivals, or in crowded camps, are brought together in places where the seeds of the poison are known to be usually found, there is the disease apt to appear, though the district may have been quite healthy before:

"At Juggernaut it is an annual visitant. The town Pooree contains 35,000 inhabitants, and the number of pilgrims sometimes amounts to 150.000. The inhabitants are usually quite healthy before the occurrence of the festival, which takes place in June or July; but immediately on the arrival of the pilgrims, and when the lodging-houses are literally crammed with inmates, cholera suddenly breaks out, and in the space of a few days hundreds are cut off by it. This is not an occasional or incidental occurrence, it is an invariable one; and the disease, which had thus been generated, as suddenly disappears on the dispersion of the crowd, a few isolated cases only occurring for two or three days after the departure of the pilgrims."

[The next determinate cause of the invasion of cholera, is the vitiation of the atmosphere from *putrid effluvia*. Some persons seem to imagine that emanations from putrescent matters are perfectly harmless, nay, in some cases, even beneficial; but the following evidence appears to prove that such was not the case during the recent epidemic:—]

"Immediately opposite Christchurch Workhouse, Spitalfields, belonging to the Whitechapel Union, and only separated from it by a narrow lane a few feet wide, there was in 1848 a manufactory of artificial manure, in which

bullock's blood and night-soil were desiccated by dry heat on a kiln, or sometimes by mere exposure of the compost to the action of the sun and air, causing a most powerful stench. The workhouse contained about 400 children and a few adult paupers. Whenever the works were actively carried on, particularly when the wind blew in the direction of the house, there were produced numerous cases of fever, of an intractable and typhoid form; a typhoid tendency to measles, small-pox, and other infantile diseases, and for some time a most unmanageable and fatal form of aphthæ of the mouth, ending in gangrene. From this cause alone twelve deaths took place among the infants in one quarter. In the month of December, 1848, when cholera had already occurred in the Whitechapel Union, sixty of the children in the workhouse were suddenly seized with violent diarrhœa in the early morning. The proprietor was compelled to close his establishment, and the children returned to their ordinary health.

Five months afterwards, the works were recommenced; in a day or two subsequently, the wind blowing from the manufactory, a most powerful stench pervaded the workhouse. In the night following forty-five of the boys, whose dormitories directly faced the manufactory, were again suddenly seized with severe diarrhœa; whilst the girls, whose dormitories were in a more distant part and faced in another direction, escaped. The manufactory having been again suppressed, there has been no return of diarrhœa up to the present time. In the summer of 1847, a similar manufactory was established in the parish of St. George, Southwark, in the midst of a dense population. It is stated that on the very first occasion when the operations of this manufactory were commenced, a most powerful stench pervaded the neighbourhood, so as to attract general notice, and that soon afterwards a large number of persons living around were suddenly seized with diarrhœa."

The supervention of bowel disorders upon exposure to putrid effluvia, is of common occurrence at all times, especially during warm weather. Severe attacks of diarrhœa, and even of dysentery, often occur on board ship, when the smell of the bilge water has become more than usually offensive; and the men sleeping near the pumps are generally observed to suffer most. Medical students are frequently obliged to discontinue their attendance at dissecting-rooms, when these are not properly ventilated, in consequence of loss of appetite and irritation of the bowels. The same effects were experienced in a marked degree by Dr. Lewis, from the offensive atmosphere of the crowded church vaults in the metropolis, as related by him in the Interment Report of the Board of Health. Again, the emptying of a cesspool is often followed by diarrhœa among some of the inmates of the house; occasionally it has induced alarming attacks of enteric disease. The case of the Boarding school at Clapham, many years ago (before the first visitation of the cholera), will be remembered by some of our readers. The facts were these: a foul cesspool had been opened, and its contents spread over a garden adjoining the playground; this was in the month of August. Within the course of two or three days, no fewer than twenty-two of the boys were seized with alarming symptoms of violent irritation of the stomach and bowels, subsultus of the muscles of the arms, and excessive prostration of strength. Two cases proved fatal. If such an event is liable to take place in ordinary seasons, how great must be the danger when the choleraic poison is abroad! The reports of Mr. Grainger and Dr. Sutherland abound with the most painful illustrations of the fact.

[Dr. Gavin places the accumulation of ordure as one of the principal causes of filth.]

In one court in St. Giles, Lascelles-court, consisting of ten or twelve houses, seventeen deaths took place within a fortnight. It is one of the most disgusting places imaginable. Besides other causes of insalubrity, there is but one privy for the use of all the inhabitants, eighty or ninety in number; it is usually overflowing, and the surface of the pavement is bestrewed with excrement, and reeking with urine. Not a breath of air can reach this court, except by downward and upward interchange; so completely is it hemmed in on all sides. Shall we continue to wonder at the ravages of disease, while such enormities abound?

The west-end of London has its plague spots, as well as the middle and the east; and, if Whitechapel has its manufactories of ordure, and Bethnal Green and St. Giles their loathsome abominations in courts and streets, Notting Hill has its "Potteries," or, as they would more appropriately be called, its "Piggeries," (3000 it is said) that are kept there in the most disgusting filth. It is scarcely possible to give an idea of this place, in the immediate neighbourhood, too, of handsome villas and rows of stately houses. The dwellings, or rather hovels, in which the people live, are unsurpassed in nastiness by anything known in Ireland. The streets, courts, alleys, and yards, are without a drop of clear water; there are no sewers in any part of the locality, and all the drainage of the pigsties and privies is left on the surface, close to the very doors and windows of the houses, or flows lazily into a large stagnant pond, called the "Ocean," which is covered with a filthy slime, and is continually bubbling with putrescent gas. The atmosphere is of course constantly charged with the most offensive effluvia. What the result of such a state of things has been on the health of the residents, is shown by Dr. Lewis's report.

No sets of cases are more interesting and suggestive in a sanitary point of view, than those in which very partial and circumscribed outbreaks of zymotic diseases occur in districts that are noted for healthfulness, and for general exemption from their ravages. Of such outbreaks, the late epidemic afforded some striking examples:—In Highgate, with a population of about 3000, only six cases of cholera occurred, and all of them among the members of one family, living in two adjoining houses, situated at the top of Swaine's-lane. This is a place which has long been noted among the inhabitants for its offensive nuisances, and which Mr. Moger, the medical officer of the district,—knowing that it was almost invariably the *habitat* of whatever epidemic disorder happened to be prevalent,—felt so convinced would be the spot attacked by cholera if the pestilence should visit Highgate, that he had made, in the course of the preceding summer, repeated complaints respecting it to the Board of Guardians, in the hope of correcting its sanitary condition; but without avail. Besides a large cow-shed on one side, where an immense accumulation of dung was collected, there was on the opposite side of the lane, in the backyard of the house where the first cases occurred, a foul overflowing privy, immediately facing and within a few feet of the door. The stench of this was horrible, Mr. Moger stated, especially at night, when he had to remain some time in the room with his patients, while the disgusting effluvium from the filthy cow-shed opposite, quite sickened him as he approached the house.

Equally instructive is what took place at Hampstead, where, during the season, only nine fatal cases of cholera occurred. One was in the person of a gentleman who had fled from his house in Albion-terrace in the Wandsworth-road to the well-known inn, Jack Straw's Castle, on the top of the Heath, in the hope of escaping the pestilence; but the disease was already in his system and he died on the following day.

Of the remaining eight cases, no fewer than six, (of which four were fatal,) occurred in a family living in rooms over a stable,* in the rear of the George Inn, near Downshire-hill. "At the stable door was a dung-pit, which had not been emptied for some weeks; in the stable, in addition to the ordinary sources of impurity, there were three or four pots to collect the urine of the animals, and usually emptied twice a week. In the yard at the rear, and into which one or two of the windows looked, was a privy that stunk abominably, and within two or three yards of it a pigstye, scarcely less offensive; the privy had been most injudiciously emptied out, a day or two after the first death took place."

* The disease was observed in several instances to be extremely virulent in such dwellings. Three fatal cases occurred in a room over the stable in Paradise-place, St. Pancras: "The floor was full of openings, so as readily to admit the foul effluvium to pass through." Two instances of the *foudroyant* form of the disease, where the patient is struck down as by the deadly poison, and dies without vomiting or purging, are mentioned by Mr. Cooper, of Southampton: the victims lived in rooms underneath which was an immense accumulation of dung. Many other instances might be adduced.

There is certainly not a more frequent or more perilous source of mischief during the prevalence of epidemic disease, than foul and obstructed drains; and it is unfortunately the fact that the construction of these works has hitherto been so very faulty, that in many parts of the metropolis, as well as in every town and city throughout the kingdom, instead of being conduits for the removal of decaying refuse, they are no better than elongated cess-pools, which detain their stagnant contents, and regurgigate their noxious effluvia into the interior of the houses with which they are connected. Every one who has been in the habit of visiting the dwellings, not of the poor only, but also of many of the respectable working-classes and of small shopkeepers, must be aware how disgusting is the stench from the drains, more especially in certain states of the atmosphere—the very states, be it observed, that are apt to prevail in sickly seasons. What then must be the condition of such dwellings at night, when all the doors and windows of the house are closed, and ventilation is thus most effectually prevented, and when the atmosphere of the rooms is moreover vitiated by the respiration of the numerous inmates? So thoroughly bad is the state of the drains in most of the humble districts in every town, arising from ignorance and neglect in the mode of their construction, that it would be infinitely better if they were no such works at all, and if the removal of house refuse was effected by systematic and regular scavenging.

Nowhere were the pernicious effects of stinking mud more conspicuously displayed, than in that horrible locality, which is described in the following passage by Mr. Walsh; to whom, aided by Mr. Martin, the district surgeon, many of the wretched inhabitants were indebted for a supply of water during the height of the epidemic:

"Jacob's Island is the name given to a portion of the parish of Christchurch, Bermondsey. It is surrounded by the tidal ditch or mill stream. In the island and on the banks of the ditch are 300 or 400 houses. The drains and sewers of all the houses that are drained empty themselves into the ditch. The refuse of the neighbouring houses and the contents of their privies are also thrown into the almost stagnant water. One hundred and fifty of the houses have no water supply whatever; many of the inhabitants are in the habit of using the water for cooking and other purposes; nay, even drink it unboiled. Some of the houses are totally unsupplied with water from any other source than the ditch; a few have wells which communicate with it. The analysis shows the immense quantity of organic matter which it contains. The ebb and flow of the tide are regulated by a floodgate; the occupier of the mill lets the water in and out as he pleases; sometimes it is retained for many days, and sometimes the bed is nearly dry for the same length of time. The foulness of the water and of the mud at these times is incredible. Dead animals abound in it."

No description by word or pen can give the readers an adequate idea of the disgusting scene, whenever the water is low, in the foul tidal ditches; it must be seen to form an idea of it. The existence of such a state of things in our metropolis is a disgrace to us as a Christian people, and cannot but call down a judgment from Heaven. And what, pray, is the constant amount of sickness and death among the inhabitants of this place, but a judicial warning to our rulers? The people themselves, from long habit, seem to have become nearly indifferent to the abominations around them. Whoever reads with any attention the weekly reports of the Registrar-General, cannot fail to have noticed the numerous deaths that are continually occurring there. It was, of course, severely visited by the terrible "inspector of nuisances," on its late, as well as its former visitation. Mr. Walsh says:

"In 1832 the earliest fatal cases of cholera occurred close to this ditch; in 1849, also, the earliest fatal cases occurred here; diarrhœa and cholera abounded; hardly a house escaped, perhaps not one. On the south side of an irregular square, formed by the tidal ditch and its immediate neighbourhood, there occurred between June and October forty-one deaths, in the centre twelve, and on the west side eight, making a total of sixty-one deaths."

The following Eastern picture forms a suitable pendant to that from the shores of the Thames:

"Cholera," says Mr. Rogers, may prevail amongst the inhabitants of some streets in a town to a great extent, whilst the neighbouring streets and the whole of the surrounding country are free from it. I have several times known such an occurrence in Madras. The Coom river winds very circuitously through Madras, and in its meanderings it nearly encircles the village of Chintandrepett. This river was made a necessary of by hundreds of natives daily throughout the year; and when the monsoon was heavy, and the bottom of this Augean stable was thoroughly cleansed, no ill resulted from it; but if the monsoon failed, and the river remained uncleansed, when the hot weather returned, the water became low, and the filth at the bottom was exposed to the heat of the sun, the smell was most offensive, *and an attack of cholera was the certain result, its only victims being the inhabitants residing within a short distance of its banks.*"

[As the influence of a humid atmosphere in the predisposition of cholera has been very generally recognised, we may mention as a third determinate cause—*dampness*.

The exceeding moisture of the atmosphere just before the outburst at Kurrachee, is noticed by Mr. Thom; and the same thing has been observed on several other like occasions. It is to be remembered, however, that atmospheric humidity, like atmospheric heat, is far from being a constant accompaniment of the prevalence of cholera. Allusion has already been made to the physical condition of the rock of Bellary, and of the country round. It is also to be remarked that, during the height of the late epidemic in the metropolis, the air was unusually dry. But then—and this is a point meriting particular attention—it was very close and oppressive, and so stagnant, that when there was a strong breeze blowing at the top of the Observatory at Greenwich and over Blackheath, there was not the slightest breath of wind on the banks of the Thames. This stagnant motionless state of the atmosphere, especially if associated with considerable heat, is the most pernicious of all to health. Putrid effluvia are not dissipated or dispersed, while the process of putrefaction appears to go on with unusual activity; and the vapours exhaled from a river, canal, or ill-drained ground, rest like a thick fog over the spot whence they have risen. From what we observe of vegetable blights, it is probable, too, that the molecular germs of zymotic disease are more rapidly developed under the meteorological conditions now noted. In tropical countries, dysentery more especially is extremely apt to occur immediately after such weather. But whether this conjecture be correct or not, there can be no doubt that the body is then peculiarly susceptible of morbid action. All the eliminating operations, without exception, are imperfectly or irregularly performed, but probably the functions of no organ or system are so much deranged and impeded, as are those of the skin. Attention has not been sufficiently drawn to the important part which the cutaneous tissue plays in relation to health and disease. In addition to a very large amount of watery vapour (thirty oz. on an average per diem), thrown off by perspiration, there is from the skin, as from the lungs, a constant discharge of excrementitious matter, amounting it is believed, to nearly two oz. in the course of twenty-four hours. In close foggy weather, the perspiration clings to the surface, and the function of excretion is of course obstructed. But besides the retention of effete matter thus induced, the redundant animal heat of the system is not duly carried off, in consequence of the diminished amount of cutaneous evaporation; and a state of feverishness and irritability is necessarily the result. Nor can we wonder at this, when we learn that it has been found by experiment, that, from a surface equal to a disc of six inches in diameter, with the dew point at 83°, and a temperature of 90° in the shade, the evaporation per minute would be equal to half a grain in a calm, 1·40 in a moderate breeze, and 2·10 in a brisk wind; thus making the quantity of fluid removed from the system to be nearly three times in a moderate breeze, and upwards of four times in a fresh wind, as much as in a calm or stagnant state of the atmosphere. The dreadful distress from a hot, moist, and stagnant atmosphere, in a tropical country, is well described by Mr.

Thom. Besides the extreme languor and inability for exertion, the oppression of breathing, &c., we read of "the body being bathed in perspiration, and the skin corrugated, as if it had been immersed for a long time in water," less from the excess of perspiration than from the suspended evaporation.

But the skin, like the lungs, is provided with absorbing as well as with exhaling vessels. The activity of the cutaneous absorption is much influenced by the condition of the body, being less after a full meal than when fasting; also by the state of the air; for—the very reverse holds true of the excretory function—it is much greater in a moist than in a dry atmosphere. This point deserves especial notice: viz., that atmospheric moisture appears to stimulate the action of the cutaneous absorbents, and at the same time to impede that of the exhalants; whilst, vice versâ, in dry weather, the exhalation from the surface goes on with energy, while the absorbing process is comparatively inactive. This physiological fact has a bearing on our present inquiry. It has been suspected by some experienced observers, that marsh miasmatic and other forms of malarious poison finds admission into the system chiefly by the skin, and several facts render the idea far from being improbable; at all events, every one recognises the great importance of protecting the surface with woollen clothing, as one of the most approved preservatives of health in agueish localities. Moreover, it is not irrelevant to remind the reader, that a very large majority of choleraic seizures take place at night, or very early in the morning; and it need scarcely be stated, that the potency of all miasmata has invariably been recognised to be greater after sunset, more especially when the evenings are very humid. That the aërial poison has a tendency then to descend with the atmospheric moisture nearer to the surface of the ground, is rendered probable by many circumstances; and, among the rest, by the greater insalubrity of ground-flour and basement rooms, than of higher ones, for sleeping apartments; although it is not to be forgotten, at the same time, that the former are less removed from the seat of most domiciliary nuisances. Without, however, dwelling at present on these and other kindred points, we shall only remark, that it is of first-rate importance to maintain a circulation of air—warm and dry, if possible—through all sleeping rooms, during the prevalence of an epidemic disease like cholera. With this view much good has been obtained from keeping a small fire continually in the chamber; also from the use of Dr. Arnott's valves, air-bricks in the walls, &c.

[Under a fourth division of causes may be mentioned—impure water, unwholesome or insufficient food, intemperance, and fatigue from whatever cause induced.]—*Brit. and For. Medico-Chirurg. Review, Jan.* 1851. *p.* 2.

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# A SYNOPSIS,

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THE FOREGOING PAGES OF THIS VOLUME: AND SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE LAST HALF-YEAR. (ARRANGED ALPHABETICALLY.)

## DISEASES AFFECTING THE SYSTEM GENERALLY.

DIAPHORESIS.—Hot water applications seem to be a very valuable means of producing diaphoresis in fevers. The application is made repeatedly to the stomach and upper part of the abdomen, and the patient covered carefully over with blankets, which are closed around the feet and throat, so as to confine the heat thus generated. (Mr. Bulley, *Med. Times*, Dec. 21, 1850, p. 659.)

RHEUMATISM.—Dr. Golding Bird, where the joints are exquisitely tender in rheumatic fever, uses soda poultices, the ordinary linseed poultice made with a solution of carbonate of soda instead of plain water. (See p. 53.)

*Acute.*—Remarkable benefit seems to have resulted from the employment of lemon juice in these cases. There are some cautions, however, to be observed in its administration, as all cases do not seem adapted for its employment. There are two kinds of rheumatic cases in which it decidedly fails, those of a cachectic and those of a syphilitic character. In these cases where it has assumed a gouty character with deposits of lithate of soda in and about the smaller joints, the continued use of lemon juice combined with small doses of sesquichloride of iron have been attended with remarkable benefit, deposits being frequently absorbed which have resisted all other treatment. With regard to the dose in acute rheumatism from ʒj to ʒij, should be given every four or six hours, and should pain be felt in the bowels, or diarrhœa occur, which is very rarely the case, four or five minims of tincture of opium may be added to each dose of the remedy. (Or. G. Owen Rees, p. 53.)

The application, locally, of the Dutch liquid to the joints in this disease is highly recommended. A moist compress sprinkled with the agent, is applied and renewed once in twenty-four hours, being inclosed in impervious bandages so as to prevent its evaporation. It is to be applied to each joint in succession as it becomes inflamed. The complications of rheumatism may be treated on general principles at the same time. (Dr. Aran, 54.)

*Tropical.*—The indications of treatment in both Tropical and European rheumatism, are,—1st. To subdue constitutional irritation and fever by narcotics and refrigerants. Although blood-letting is of undoubted efficacy in a general inflammatory diathesis, yet, as the general tendency to rheumatism is to anæmia, we must not waste carelessly the nutritive resources of the constitution. We must be guided by the state of the blood clot, and its effects in mitigating the fever and subduing irritation. The temperament and habits of the patient must also be considered, as well as the climate and locality in which he is situated. After bleeding, give ten grains of nitrate of potash, with small doses of antimony and citrate of potash, three or four times a day; or it may be continued with nitrous ether and other diuretics, the intention being to subdue heat and irritation, by restoring the normal excretory functions of the skin and kidneys. The great utility of nitrate of potash seems to be dependent on its power of diminishing the plasticity of the blood, and suspending the metamorphic disposition of the blood globules to produce fibrine. Its effect may be increased by the addition of anodynes at bed-time, such as opium and aconite.

The 2d indication named, is to eliminate from the system certain cholæic elements, and other excrementitious matters of the blood, which render the urine acid and occasion in it lithic deposits. To fulfil this, calomel and Dover's powder must be given at bed-time, to be followed next morning by a solution of the sulphate of magnesia in compound senna infusion, with the addition of an alkali, and colchicum, will be found most useful. Colchicum is stated to be most useful in cases of acute disease, accompanied by a foul loaded tongue, biliary derangement, and intestinal mucous accumulation. The best mode of administering it in India is to give the wine of colchicum twice or thrice a day in a weak solution of tartarized antimony, along with liqvor potasse, and the tincture of the hydrochlorate of morphia. Where diarrhœa or the purgative effect of colchicum is established, there the amount of urea and uric acid in the urine appears to be diminished, these compounds being apparently eliminated by the intestinal evacuations. Contrary to general opinion the use of colchicum appears to have very little diuretic action, and to produce little effect upon the constituents of the urine. It augments the activity of the skin and lungs in exhaling carbonic acid, and after a time its effect in causing an augmented secretion of becomes apparent; the melanotic globules which are unable to combine with the oxygen of the air being destroyed in the hepatic system afford materials for an augmented secretion of bile. Calomel should be given rather to produce its purgative effects, than with opium to produce its constitutional effect. In this manner it will be found of much utility by depurating the blood through the increased biliary secretion, in those hyper-carbonized states of the system associated with the disease in many instances.

from small vessels like rest and exposure to air. The surgeon who has least fear of hemorrhage loses the least blood. "A small wound may be tortured by styptics, by compression, and by other unprofitable agents, till it becomes the fruitful source of hemorrhage." Instances are recorded of the most alarming cases of hemorrhage being at once arrested by the wound being freely exposed to the air. (Mr. F. C. Skey, p. 150.)

## AFFECTIONS OF THE RESPIRATORY ORGANS.

Asthma.—Give a quarter to three grains of the extract of stramonium, or from ten to thirty minims of the tincture, or the various parts of the plant may be smoked in a pipe, or the leaves alone rolled up in the form of a cigar. Ether in combination with opium will often prove of great service. (Dr. Todd, p. 112.)

Hæmoptysis.—In hemorrhage from the lungs or uterus, give small doses of ipecacuanha combined with acetate of lead and opium. (Dr. Jenner Coxe, p. 299.)

Phthisis Pulmonalis.—Do not let the patient breathe an atmosphere warmed by stove-heat, even although equable in its temperature; it is stated to be extremely prejudicial. If the patient cannot rest at night for coughing, give gr. iv. of the ext. of hemlock, with gr. ss. of ipecac., and one-eighth gr. of muriate of morphia, at bed-time. Immediately on the first suspicion of pulmonary consumption, give the cod-liver oil, commencing with ℥ j for a dose, three times a day, and seldom exceeding ℥ iv. Counter-irritation is of essential importance: employ a solution of ʒ j of iodine and iodide of potass. to ʒ ij of spirits of wine. Use it first on one side and then on the other, even if one lung only is affected. By these measures the cough is allayed, the weight is increased, rest is procured, and counter-irritation is set up. Collateral symptoms must be met as they arise; if hectic fever or hæmoptysis appear, we must suspend the oil. (Dr. Hutchinson, p. 105.)

Respiratory Affections *in Children*.—As an emetic and expectorant, in many of the affections of the respiratory organs of children, give ipecacuanha. (Dr. Jenner Coxe, p. 299.)

## AFFECTIONS OF THE DIGESTIVE ORGANS.

Cleft Palate.—It is from fibres of the levator palati muscle, and not from those of the tensor palati, that so much trouble frequently arises in producing union of the wound after the operation for cleft palate. It is absolutely necessary, therefore, to divide this muscle in the operation; it is frequently very detrimental to remove the sutures too early; the stitches had better not be meddled with so long as they appear of any use, they need not be removed after eight and forty hours, as is too frequently the case. (Prof. Fergusson, p. 156.)

Diarrhœa.—Creosote in the following form has proved very valuable: Creosoti ♏ j ad v; sp. ammon. arom. ♏ xv ad ℥j; aquæ ʒj ad ʒiss; and where pain has been severe, tinct. camph. co. has been added. (Mr. W. B. Kesteven, p. 124.)

*Chronic.*—In chronic diarrhœa give small doses of ipecacuanha, repeated several times a day. If dependent upon the derangement of the biliary secretion, unite it with two or three grains of blue pill, repeated for three or four nights. (Dr. Jenner Coxe, p. 299.)

*Scrofulous.*—The most striking and satisfactory results may be obtained by administering six to ten grains of the phosphate of lime per diem. (Dr. Beneke, *Lancet*, April 19, 1851, p. 434.)

Diphtheritis.—Locally use a solution of nitrate of silver, never less than ℥j to ʒij, sometimes ℥ij., applied three times a day, or oftener, to the tonsils and affected parts, with a piece of sponge fastened to a quill. As to the general treatment give calomel and ipecacuanha, in varying doses from half a grain each, according to the age of the patient and the severity of the case, every four or eight hours; use emetics in the first stages, in the latter stages they only exhaust. In desperate cases employ the inhalation of vinegar va-

pour, and the vapour of hyd. c. creta. The local application of nitrate of silver, and the judicious administration of stimulants, are, however, most to be relied upon. (Mr. J. D. Brown, p. 117.)

Dysentery.—In cases of dysentery, especially when assuming a typhoid character, give ipecacuanha. (Dr. Jenner Coxe, p. 299.)

Fistula in Ano.—This disease has recently been treated successfully by the platinum wire made red-hot by a galvanic battery. One end of the platinum wire was introduced into the fistulous tract, and was made to reappear at the anus: the two ends were then connected with the poles, the circuit completed, the wire became red-hot, and was gently brought downwards dividing all the interposed tissues, and cauterizing them so effectually as to prevent any amount of hemorrhage. The only dressing used was a piece of lint dipped in cold water, applied externally. The whole tract heals rapidly from the bottom after the casting off of the eschar, which separation generally takes place in a few days. (Mr. Marshall, p. 315.)

Hare-Lip.—In some observations made by Professor Fergusson, he describes an apparatus introduced by the father of one of his patients, whereby the necessity of drawing the parts together after hare-lip operation is avoided, the apparatus *pushing them* into intimate contact. A drawing is given of this apparatus at page 154.

Hæmorrhoids.—The hæmorrhoidal tumours are to be drawn out by a peculiar kind of forceps, and a platinum wire made red-hot by the galvanic battery is to be applied to the pedicle of the tumour, and drawn slowly across. This is to be repeated for different portions of the growths, and where a little oozing of blood takes place the wire is made to cauterize the part slightly, which measure at once stops the flow of blood. The section should be made slowly, otherwise there may be a little hemorrhage. The forceps alluded to, differ from the usual instrument, in having a ring about an inch in diameter at the end of each branch; when the forceps are closed the rings are superposed, and we gain a very firm hold of the parts to be secured. (Mr. Marshall, p. 315.)

Pass a thin copper or iron wire in the form of a loop made through a double canula around the root of the growth, and strangulate it by drawing the wire tight. The canula may then be retained in its situation for any length of time, from half an hour to an hour or more, and the pile may then be removed with a knife or a pair of scissors. Should bleeding occur, immediate pressure may be made by the finger, or by pads of lint. Serious hemorrhage, however, it is stated, is of rare occurrence. (Mr. F. C. Skey, p. 186.)

Lead Colic.—The internal and external use of chloroform is recommended as a most valuable agent for removing the pain, calming the spasms, and facilitating the action of purgatives in cases of lead colic. (Dr. Aran, p. 126.)

Mr. Brachet employs croton oil in doses of one and a half to two drops, and repeating it for from four to eight days; but it is to *alum* he looks as his sheet-anchor. He prescribes one and a half to two drachms of alum in a ptisan, with forty or fifty drops of laudanum, to be taken during the day; and, if the bowels do not act by the third day, he gives a mild aperient, the alum being continued a day or two after the symptoms have disappeared. (p. 287.)

Lead Palsy.—Brucine is said to possess advantages over strychnine, as it can be administered in larger doses. It may be given in doses of two or three centigrammes (about one-third to half a grain) daily, and sometimes even in doses of eighty centigrammes, but this is rarely necessary. Ten or fifteen centigrammes produce slight twitchings; twenty or twenty-five produce them in a violent degree. (M. Bricheteau, p. 99.)

Obstruction *of the Bowels*.—If the ordinary common aperients have failed, first to throw up a large enema; if this is of no avail do not give any more purgative medicines. Endeavour, in the first place, to compose and soothe the mind of the patient. A slight faintness, produced by blood-letting, has often acted beneficially in this state. After these measures the safest plan is to give repeated doses of calomel and opium, the latter in half to one grain doses every four hours. Wait now until the bowels begin to act, which they

generally will do, and when they do, then a small dose of castor-oil will do good. Gruel may be taken now, as it prevents the sense of sinking, and probably acts mechanically in propelling the contents of the intestinal tube. In these cases abstain from giving any food by the mouth for some days. The support should be entirely trusted to beef-tea injections, these not exceeding a quarter of a pint, and administered every four hours. If there is difficulty of retention add to them a few drops of laudanum. (Dr. E. Wells, p. 119.)

Prolapsus Recti.—Pass a strong ligature, by means of the crooked needle, through the anus laterally, introducing the needle an inch from the verge of the anus on the left side, and transfixing the rectum at the depth of half-an-inch, making it emerge on the right side, at the same distance as on the opposite. This being done the ligature is firmly tied, and the patient is put to bed with ice applied to the part to prevent undue inflammatory action. The ligature is maintained until its presence has brought on considerable fever, or the pain becomes intolerable, when it is removed, and the ice continued for several days until the cure is completed. (M. J. Mackenzie, p. 184.)

Tænia.—Forty or fifty grammes (℥ x to ℥ xiii) of the powder of male fern may be given in divided doses in the morning, and a purgative of castor oil directly after; or two grammes of the oil, with enough powder of fern to make ten boluses, which are taken in the morning an hour between each. (M. Martin-Solon, p. 122.)

[The lengthened process and formulæ used by Schmidt, for the expulsion of tape-worm, our readers will find given at page 124.]

Ulcers *external to the Anal Aperture*.—These must be treated by the recumbent position to relieve the hæmorrhoidal veins, keeping the bowels open by castor oil, which acts on the entire course of the intestinal canal, and lubricates the hard exterior of the fæcal mass as it passes through the rectum; and by applying the following ointment: unguent. opii, ℥ j; ung. hydrarg. fort., ℥ iij., to be applied two or three times a day. (Mr. J. Hilton, p. 176.)

## AFFECTIONS OF THE URINARY ORGANS.

Lithotomy.—In a complicated case, occurring under Mr. Erichsen, in University College Hospital, the concretion had become permanently or temporarily lodged in the upper fundus of the bladder, behind the pubes, thus eluding the grasp of the forceps. To obviate this condition, Mr. Erichsen directed pressure to be made immediately above the pubes, and succeeded, by this manœuvre, in accomplishing its extraction, with the aid of a curved scoop. Two similar cases are mentioned by Mr. Aston Key, who removed the difficulty in a similar manner. (Mr. H. Thompson, p. 198.)

Lithority.—No attempt to extract any portion of stone through the urethra should be made with the lithotrite; the operator should be content with crushing the stone in the bladder. If a portion of the stone should become impacted in the urethra, it is much safer to cut down upon it and remove it, than lacerate the urethra by efforts at extraction. (Mr. Charles Hawkins, p. 200.)

Renal Disease.—An observation of great importance in the diagnosis of renal disease has been recently made by Dr. Johnson, viz., that disease of the kidney, of a recent acute nature, is indicated chiefly by the presence of fibrinous matter entangling "entire epithelial cells" with albumen, and very commonly blood; while, on the other hand, "granular particles of disintegrated epithelium" indicate a disease of a chronic character. (Dr. G. Johnson, p. 136.)

Retention of Urine.—A case is recorded by Mr. Wakley of retention of urine occurring in a child in which recovery rapidly took place, although the symptoms previously were very alarming after the performance of the operation of puncturing the bladder above the pubes. (Mr. T. H. Wakley, p. 198.)

Stricture of the Urethra.—In a recent paper Mr. Wade lays great stress upon the value of the potassa fusa in obstinate cases of stricture. He only uses it, however, in cases where simple dilatation proved ineffectual, and not like Mr. Whately in all cases indiscriminately. The three cases in which he commonly uses it are—1st. Impervious strictures, which are of a cartilaginous

hardness. 2d. Long standing strictures, which bleed more or less freely on the introdnction of any instrument. 3d. Irritable strictures. The potassa fusa is applied in the ordinary manner by means of a bougie armed with it. (Mr. R. Wade, p. 194.)

[Several *new instruments* for the cure of stricture have recently been introduced to the notice of the profession by Mr. Thomas H. Wakley. Many eminent surgeons have approved of the principle of treatment which their use involves. These instruments are figured and described at page 192.]

## AFFECTIONS OF THE SKIN, &c.

Glandular Enlargements *in the Groin and Axilla*.—These tumours, often met with in young men, and not of a venereal nature, are often exceedingly indolent. Make a tolerably sized eschar with caustic potash in the early stage, and cover it with a small poultice. When the eschar separates the tumour will have disappeared. (Dr. B. G. Darley, p. 297.)

Granulating Surfaces.—To protect raw granulating surfaces from the atmosphere, lay a thick semifluid aqueous solution of gum tragacanth on the raw surface; if it is imperfect in any part repair such by another layer. This application produces no irritation, and being translucent permits a complete surveillance. (Professor Miller, p. 288.)

Itch.—Use a sulpho-alkaline ointment. If there is a great abundance of pustules, and this excites too much pain, use frictions of lard and oil. Another ointment recently tried cures in three frictions, soothes the itching instantly, and does not give rise to any secondary eruption. It is composed of equal parts of fresh chamomiles, olive oil, and lard. M. Bourguignon makes an ointment by mixing 300 parts of the powder of staphysagria to 500 of lard, keeping it at a temperature of 100° C. for twenty-four hours. The frictions to be made four times a day, the cure being complete by the fourth day. (MM. Bazin and Bourguignon, p. 291.)

Lepra, *Syphilitic*.—Give five grains of blue pill night and morning, thus affecting the system slowly and gradually by a mild and unirritating preparation of the mineral. Iodide of potassium favours the mercurial influence, at the same time exercising some specific antidotal power of its own. Hyper-salivation, violent iodism, irritation of the bowels and of the skin, and peculiar nervous affections are produced when too much of these minerals is thrown into the system, with a desire to produce a rapid effect. We may withhold them for a time, renewing them again as occasion may suggest. It is sometimes much more desirable to introduce mercury also by the skin than by the stomach. Tar is also one of the safest remedies—the pix liquida. It may be given internally in capsules, or applied externally, or both. Fifteen or twenty minims may be taken three or four times a day, at the same time the patient may be tarred over the surface, and lie in tarred sheets. This is exceedingly useful, though scarcely available in private practice. (Dr. R. B. Todd, p. 322.)

Lupus Exedens.—Mr. Hunt, imagining that from the improvement in this disease, by the local application of arsenic, being only of short duration, it must have arisen from the absorption of the drug, was led to administer the remedy internally, and the experiment was attended by the best results. In lupus non-exedens the internal use of arsenic was by no means so well marked. (Mr. T. Hunt, p. 285.)

Nævus.—Mr. John Adams has suggested, for the obliteration of deep-seated nævi, the employment of a ligature, applied subcutaneously, so as to embrace the whole of the disease without compromising in any manner the superjacent skin. (p. 153.)

Pruritus.—For the treatment of pruritus of the genital, anal, and axillary regions, first, let an ointment be made of from four to six parts of calomel to thirty of axunge; and second, a powder, composed of four-fifths of starch and one-fifth of camphor, well pulverized and mixed. These may be made stronger if necessary. If the diseased parts are covered with scales or dry crusts, as in eczema, promote their separation by using cataplasms and emollient baths, twice a day, then use frictions with the foregoing ointment, and after them, sprinkle the parts with the mixture of starch and camphor. Both are neces-

easy to effect a cure. If the pruritus occurs during pregnancy, it will often not be relieved until after delivery. If the itching of the anus depends on ascarides use mercurial ointment. (Dr. Tournie, p. 201.)

Scalds and Burns.—If there be the feeling of burning heat in the part, we can understand how cold applications would be grateful, and how the case would get well, even though they were not the best, for the powers of the nervous system would, in this case, be intact. But no one would recommend the continued application of cold to a patient labouring under the depression attendant upon a severe burn. It has been held that external applications do good by excluding atmospheric air: but the injury arises not from the irritation of the *air as air*, but from its coldness. Warm air soothes and is beneficial. It is from their effects in soothing the nervous irritability of the injured part, by preserving the nerves from feeling the variations of temperature in the currents of air which would act upon the surface, that such applications as cotton, treacle, flour, &c., are of such great value. (Mr. S. Crompton, p. 333.)

Tumours, *Encysted.*—Evacuate the contents by making a small oblique opening on the cyst. Inject then an alcoholic solution of iodine, closing the aperture with diachlyon or charpie. As soon as the inflammation has subsided, the cyst becomes detached, and may be extracted by means of the forceps. Usually, however, two or three injections are necessary to promote a complete separation. (M. Borelli, p. 295.)

*Erectile.*—Pass a large red-hot surgical needle, heated by a gas flame, through the base of the tumour. This causes effusion of lymph, alters the structure, and arrests the growth of the tumour. (Dr. Douglas Maclagan, p. 154.)

Occurring *in infants*, pass through them threads steeped in a solution of sulphate of copper, or other caustic astringent. *In children*, make a free opening with a lancet through the centre of the tumour, and the blood being thus removed, cauterize the exposed surface of the tumour strongly with the nitrate of silver, holding it in contact with the tumour for some time. (Dr. Darley, p. 152.)

Ulcers, *Chronic.*—In chronic ulcers, resulting from scrofulous diathesis, give phosphate of lime, in doses of from eight to twenty grains per diem. It should be ordered to be taken with the breakfast, dinner, and supper, so as to be thoroughly mixed with the food. These cases are accompanied always by a want of the proper cell growth, which the phosphate is said to increase in a remarkable manner. The phosphate, nevertheless, cannot be said really to cure the scrofulous dyscrasia, but we shall certainly promote the cure in the most efficient manner by its administration. (Dr. Beneke, *Lancet*, April 19, 1851, p. 431.)

*Obstinate.*—The following mixture has been recommended as being of great utility in these affections:—Tinct. of cantharides, 12 drops; iodide of potassium, ʒ ss; compound tincture of cinchona bark, ℥ j; water, seven ounces. Mix. ℥ j ter die; and apply the following lotion:—Tincture of cantharides, twelve minims; diluted nitric acid, twenty drops; compound tincture of cinchona, two drachms; water, one ounce. The tincture of cantharides is of great utility in indolent ulceration, dependent either upon atony of the engaged parts, or system generally. It is useful—1st. Where the granulations are exuberant, but pale, weak, and flabby. 2d. Where there was deficiency, or total absense of granulations, the ulcers being deep and scooped out, with raised and indurated edges. 3d. Where the granulations were not defective, but cicatrizing irregularly, sometimes in the centre, at other times on one side, the lymph which was thrown out and organized on one day being absorbed the next. (Mr. J. Tait, p. 325.)

*Cicatrization of.*—A case is related of an obstinate ulcer of the foot from injury, which baffled all attempts to procure cicatrization, but which was remarkably benefitted by the application of the electric moxa as follows:—A blister, the size of a five-shilling piece, was applied six inches above the sac, on which a piece of zinc was accurately fitted. A silver plate was now applied to the original sore, and the two connected with a piece of copper wire.

A few strips of plaster supported the apparatus, and the whole was covered with wet lint and a loose bandage. (Mr. Bransby Cooper, p. 293.)

Varicose Veins.—Mr. Skey treats these cases by forming small eschars a little larger than the diameter of a split pea, the number being regulated by the extent and complication of the disease. This is effected by applying a small portion of the caustic paste through an opening made in three or four thicknesses of adhesive plaster. A piece of plaster may be laid, then, over each quantity, and may be removed in from twenty minutes to half an hour. Rest in the horizontal position is desirable, but not essential. The healing of the ulcers, which are sometimes slow and tedious, should be pushed by bark, wine, good diet, and stimulants, if necessary. (Mr. F. C. Skey, p. 151.)

*Varicose Veins and Ulcers.*—These obstinate and disagreeable affections, have lately been treated by the application of a convoluted spiral strap of vulcanised India-rubber, instead of the ordinary uniform elastic apparatus used. If there are ulcers along with the varicose veins,—first wet with a solution of glycerine ʒss to ʒviiss medicated with a little nitric acid, a little common blotting paper, and apply it over the wound, and over this a pledget of lint or linen wet with the same solution. These may be secured by a turn or two of the calico roller, and over this is placed the convoluted spiral bandage. Mr. Startin, the author of this mode of treatment, states that great success has resulted from its employment. (Mr. J. Startin, p. 276.)

## AFFECTIONS OF THE BONES, JOINTS, &c.

Fracture *of the Thigh.*—To obviate the unfortunate tendency which exists in the upper fragment, when the femur has been fractured at the juncture of the upper with the middle third, of being tilted forwards and outwards by the action of the psoas and iliacus muscles, Mr. Wood has recently introduced a contrivance, which seems to have answered the purpose admirably. A description and engraving of this apparatus is given at page 142.

Ganglion.—[A illustration and description of an instrument resembling in some measure a common director in a lanceolote form, enclosed within a cylinder, is given at page 295. It is a modification of that of M. Jules Guerin, of Paris.]

Loose Cartilages.—[At page 273, will be found a minute description of Professor Miller's subcutaneous or valvular mode of removing loose cartilages from joints.]

Periostitis.—In obstinate cases where aggravation and suppuration seem imminent, direct incision is unwarrantable, but it may be done as follows:—Insert a fine bistoury or tenotomy needle, at a little distance from the tense part, passing it over, cautiously, beneath the integument; then turning and pressing its edge, divide the tense membrane wholly to the desired extent; now cautiously withdraw the instrument, making a valvular, oblique, subintegumental wound; finally close the single puncture immediately, with isinglass plaster or collodion. (Prof. Miller, p. 275.)

Synovial Membranes.—Where the joint is greatly and distressingly distended with serum, it is recommended to make a few minute punctures, and apply an exausted cupping glass; and as soon as pus is known to have been secreted, to make a free incision into the joint. An exploring needle should be first used to make this point certain. The opening should be free and immediate, lest the matter should make its way out of the joint in other directions, and form irregular and circuitous sinuses among the neighbouring tendons and muscles. No pressure to evacuate the matter must be used. If the opening is found not sufficiently large, or matter should again form, the opening must be enlarged, or another made in a convenient situation. (Sir Benj. Brodie, p. 271.)

## VENEREAL AFFECTIONS.

Bubo *Gangrenous.*—Apply a solution of borax, one to two drachms in a pint of water, by means of charpie, so as to cover the edges of the sac. It is essential that it should be applied night and morning. (Dr. Effenberger. p. 212.)

Gonorrhœa.—Inject into the urethra a small syringeful of a solution of chloride of zinc gr. j to the ʒj of water, every six or eight hours. This should be combined in the early period of the disease with the usual anti-inflammatory treatment. The strength of the injection may be increased to as much as three grains of the chloride to the ounce. (Mr. E. A. Lloyd, p. 210.)

Gonorrhœal Ophthalmia.—Make early free radiating incisions of the sclerotic portion of the conjunctiva, as when in a state of intense chemosis this portion is said to strangulate the vessels passing to the cornea, and thereby induce sudden sloughing and mortification. (Dr. Hamilton and Mr. B. Bell, p. 214.)

Occurring *in children* apply a solution of chloride of zinc of the strenth of one grain to the ounce. (Mr. E. A. Lloyd, p. 210.)

Syphilis.—The mode of employing mercury in the treatment of syphilitic sores by Mr. B. Cooper, and which was taught him by his uncle, Sir Astley Cooper, is as follows: He applies the common black-wash upon common linen rather than lint, as he supposes the latter to produce very frequently great irritation. He orders two kinds of mercurial pills, one kind consisting of five grains of blue pill and ½ grain of opium each, to be taken at bed-time; and five grains of blue pill only, to be taken in the morning. If the bowels are constipated the "morning pills" only are to be taken; both night and morning. Mr. Cooper thinks that, although iodine or the iodide of potassium may suspend the symptoms for a time, they do not eradicate the poison entirely from the system, or secure the patient from future attacks. A further continuance even of this remedy seems in many instances to increase the violence of the symptoms. In sloughing phagedæna mercury must be withheld; the remedies are the local application of nitric acid and the internal administration of opium. (Mr. Bransby Cooper, p. 203.)

In persons who have suffered from secondary ulcers, ulcers of the bones, &c., and who have become exceedingly weak and emaciated, give (along with the preparations of mercury, of which the iodine may be preferred) the phosphate of lime in doses of fifteen to twenty grains during the day. (Dr. Beneke, *Lancet*, *April* 19, 1851, p. 434.)

Syphilitic Periostitis.—Iodide of potassium for this disease certainly deserves the name of a specific, the chief drawback to it is, that its effects are so evanescent. To obviate this, mercury may be given with it, or a short alternate course of each, and then using only tonic means, resume the mercurial and iodine treatment if necessary. (Dr. R. B. Todd, p. 87.)

## AFFECTIONS OF THE EYE AND EAR.

Cornea, *Specks and Opacities of*.—Under the continued use of gently stimulating applications, as the nitrate of silver, many of those depositions which apparently seriously compromise distinct vision for life, may be made slowly but ultimately entirely to disappear. The proper laminated tissue seems to be capable of enlarging its vascular resources for its support under disease, and for the subsequent removal of diseased products to such an extent, that, if it has itself escaped disorganization, it is able, under favourable circumstances, completely to resume its transparency. (Dr. R. Hamilton and Mr. B. Bell, p. 214.)

Entropion.—This disease, occurring on the lower eyelids of old persons suffering from opthalmia, and for which an operation has generally been performed, has been treated successfully in many instances by the application of collodion, which, by the contraction it causes, overcomes the relaxation of the integument, and the eyelid resumes its normal position. (Mr. W. Bowman, p. 216.)

False Membranes.—[For the description of a small and beautiful instrument for the removal of false membranes from the eye, introduced by Mr. W. R. Wilde, of Dublin, see p. 212.]

Glycerine *in Deafness*.—Glycerine may be applied with tolerable hope of success when the surface of the auditory canal is hard and inelastic, shining, and of a whitish appearance; if the natural secretion be wanting, and the membrana tympani be not painful to the touch. The canal must be first cleansed by a little cotton wool and warm water, and then rubbed with dry

cotton. The glycerine is then applied on cotton wool soaked with it, care being taken to diffuse it over the surface of the tympanum. (Mr. T. H. Wakley, p. 219.

Nasal Polypi.—Pass a piece of catgut from the nostrils to the mouth, to which is fastened a piece of soft and dry sponge, corresponding in size, when firmly compressed, to the narrowest part of the nasal passage, then gently draw it forwards by the posterior fauces through the nose, and the whole of the morbid growths will commonly be brought along with it. (Dr. D. McRuer, p. 157.)

Opthalmic Diseases.—Employ tannin in the form of pommade: in thick mucilage; in fine powder; and especially in the form of a concentrated solution, one part to three of water. The affections in which this application has proved most successful have been acute and chronic blenorrhœa, œdematous swelling of the conjunctivæ, vegetating granulations, vascular and ulcerative affections of the cornea, and especially pannus. (M. Hairion, p. 215.)

Shortsightedness.—Induce a contraction of the iris by means of the extract of ginger, rubbing it over the whole forehead for five or ten minutes with the view of acting upon the fifth pair of nerves. The effect of this contraction is permanent. (Dr. A. Turnbull, p. 218.)

## MIDWIFERY AND DISEASES OF WOMEN.

Chlorosis.—Wheaten bread is said to be rendered much more nutritive for chlorotic patients, by adding a small quantity of sulphate of iron. In this way alone it can be capable of forming a substance for meat. (M. Martens, p. 304.)

Ergot of Rye.—Dr. Meigs, of Philadelphia, only uses ergot of rye at the moment or just before the birth of a child; in order to secure, if possible, a permanent and good contraction of the womb after labour, in women who are known in their preceding labour to have been subject to alarming hemorrhage. (p. 257.)

Purulent Discharges *from the Uterus*.—Inject a solution of chloride of zinc gr. j to the ℥j, every eight hours. (Mr. E. A. Lloyd, *Lancet*, Dec. 28, 1850, p. 700.)

Remittent Menstruation.—The above term is applied to those cases of menstruation which are brought nearer to, and tending to run into each other. These cases have lately been treated very successfully by Dr. Tilt, by the sulphate of quina combined with the tincture or extract of henbane, and applying belladonna plasters to each of the ovarian regions. (Dr. E. J. Tilt, p. 246.)

## MISCELLANEA.

Anæsthesia.—Dr. T. Cattell thinks the following principle, being in all cases acted upon in the induction of anæsthesia, would obviate most of the dangers attendant thereon, viz., that no anæsthetic agent should be allowed ingress to the lungs of a higher specific gravity than the air we breathe. (p. 340.)

Aperient Solution.—Professor Mattauer, in an article on constipation, speaks in the highest praise of the following aperient solution:—R. Aloes soc. ℥iiss; sodæ supercarb. ℥vj; aquæ Oiv; sp. lavend. co. ℥ij. After digesting for fourteen days, the clear liquor may either be decanted off or allowed to remain. Age improves both the taste and power of the solution. It should be given about half an hour after dinner, and supper. The common dose is ℥j, although it may be increased to ℥j. (p. 300.)

Cod-Liver Oil.—Thinking it owing to its non-absorption, that the oil sometime appeared to loose its efficacy, M. Loze, a naval surgeon, combined it with a mucilage containing pancreatic juice, which thus forms an artificial chyle. He states it to be thus completely and readily absorbed, and in phthisis its effect more directly obtained. (p. 299.)

Feeding-Bottle.—[A description of the "Biberon," or new feeding-bottle

for infants, invented by M. Darbo, of Paris, and introduced into this country by Mr. Elam, of Oxford Street, will be found at p. 301.]

INHALATION.—Two kinds of inhalers, a large and a small variety, have been lately described, for the purpose of the introduction of medicinal substances into the system by inhalation. They are mentioned as being more particularly adapted for the administration of opium. (Dr. Snow, p. 336.)

IRON, *Phosphate of*.—Two specimens, one solid, the other fluid, have been introduced, of phosphate of iron dissolved in the metabasic acid in a boiling state, and allowed to cool. If exposed to the air for a day it hardens, but can be made at once into pills, by means of liquorice powder of flour. It is stated to be superior to the other preparations of iron. Dose, one to two grains, three times a day. (Dr. Routh, *London Journal of Medicine*, March, 1851, p. 270.)

*Ammonio-Acetas Ferri*.—Dissolve one drachm of iron wire in half an ounce of hydrochloric acid, mixed with an equal quantity of water (by measure); then add half a gallon of water, and precipitate with five ounces of liquor potassæ; set aside for twenty-four hours; draw off the supernatant liquor with a syphon; fill again with water, and repeat the process a third time. Lastly, collect the precipitate on a linen filter; dissolve the oxide thus prepared in two ounces of strong acetic acid, and make up the measure to ten ounces with distilled water; set aside for twenty-four hours, and filter. To every twenty ounces of the filtered liquor add half a drachm of strong liquor ammoniæ. Dose, ten minims to half a drachm. (Mr. A. G. Roper, p. 301.)

*Syrupus Ferri Acetatis*.—Dissolve two pounds of sugar in ten ounces of water, in a water bath; to the syrup, whilst hot, add eleven ounces of the acetate of iron prepared as above (without the ammonia); when cold filter through paper. Dose, twenty minims to one drachm. (Mr. A. G. Roper, p. 301.)

POISONING *by Arsenic*.—Wash out the stomach, by means of the double action stomach pump, with a solution of chromate of iron or alumina, or a mixture of permanganate of potassa solution, or with hydrate and acetate of ferric oxide, or with hydrate and acetate of alumina. By these compounds the soluble arsenious acid is immediately converted into insoluble arsenic acid, or into the insoluble sesquiarseniate of alumina, iron, or chrome. Ten grains of the permanganate of potassa may be mixed with half a pint of the aluminous emulsion, under which circumstances, its irritant action would be very trifling, not more than that of an ordinary sulphate of zinc emetic. (Mr. W. Odling, p. 317.)

QUININE, *without its Bitterness*.—To deprive quinine of its bitterness, combine ten grains of it with two grains of tannic acid. (Dr. R. H. Thomas, p. 336.)

STOMACH PUMP.—[A description and wood-cut of the new form of stomach-pump introduced by Dr. W. Falconer, of Bath, will be found at p. 302.]

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THE

# RETROSPECT

OF

# PRACTICAL MEDICINE & SURGERY,

BEING

## A Half-Yearly Journal,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.


EDITED BY

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# PRACTICAL MEDICINE,

&c., &c.

## DISEASES AFFECTING THE SYSTEM GENERALLY.

### ART. 1.—ON THE DIAGNOSIS OF FEVERS.

[THE investigations which have been carried on within the last few years, have led physicians to consider that the symptoms and post-mortem lesions of continued fever are not attributable to any variations in its character, but to the presence of two or three diseases allied as to community of character, but separated by peculiar and distinctive marks, and which being mixed up in various proportions, give to each epidemic a peculiarity according to the predominance of the existing disease. We must first examine whether this disease (continued fever) can be separated from the affections with which it has so far been confounded. The disease here alluded to has received many names, as "Seven-day Fever," "Bilious Remittent Fever," the "Mild Yellow Fever," &c. Perhaps as good a name as any, as indicating the main feature, is the one generally used, viz., the "Relapsing Fever." Let us select the main symptoms, suggesting the fundamental differences between this and other fevers.]

*Relapsing Fever affects all ages and both sexes, and perhaps in an equal ratio.*—In its onset there does not appear to be anything distinctive, unless the suddenness of the accession, and the severity of the early muscular and articular pains, lead to a suspicion of the real affection. But after two or three days, the symptoms, although not absolutely distinctive, become more marked; the feverishness is considerable; the muscular pains and headache severe; and on the second or third day there are, for the most part, more or less severe pain and tenderness about the epigastrium, and vomiting; there is, however, no other abdominal tenderness, and diarrhœa is generally absent. The heat of skin is alternated both with rigors and sweating, so that the resemblance to an irregular intermittent has been noted by several writers. On the third or fourth day, the symptoms are at their height; and a typical case, that is, a case presenting the main diagnostic symptoms, and no others, can be generally known by the slightness of the head-symptoms, the chief being headache, and in a small proportion of cases (about 8 per cent.), delirium, by the absence of chest-symptoms, and by the presence of epigastric and splenic tenderness, and vomiting, engrafted on a severe pyrexial state; that is to say, a state characterised by great restlessness and sleeplessness, a hot skin, the temperature of which may rise to 107°, a white tongue, thirst, and a pulse which is seldom below 100, in more than half the cases more than 120, and in a considerable number is still higher than this, yet whose rapidity and sharpness are not indicative of commensurate danger. In a certain number of cases, as more particularly noticed below, on the third or fourth day, a peculiar tint of skin becomes perceptible; to use Dr. Cormack's expression, there is a slight "bronzing," which is most marked in the face; this appears to be the commencement of an approaching attack of jaundice, which becomes more fully declared on the fifth or sixth day of disease; the vomiting is now often severe, the matters vomited being bilious, or sometimes even coffee-ground like, or being absolutely like the black vomit of yellow fever. This jaundice is not attributable to any obstruction in the ductus communis choledochus, as bile passes freely, and even copiously, with the stools, and as after death the gall-duct is pervious. In these yellow cases there is generally tenderness over the liver, which may be also enlarged. The spleen is also

often enlarged. If the patient be now bled, the blood is often buffed, and the serum is sometimes yellow, sometimes unusually green.

A day or two after this, when every symptom appears hourly becoming graver, when the restlessness and general distress have reached their highest point, there ensues, in the majority of cases, though not in all, a most remarkable series of symptoms, followed by as remarkable an intermission of all symptoms, and an apparent restoration to health. This period has received the name of "Crisis," although it would have been very desirable if some other term than this, to which so many meanings have been given, had been chosen. For the most part, at this period, the patient falls into a profuse sweat, which lasts sometimes for thirty or thirty-six hours, but is usually shorter than this. The chemical qualities of this sweat have not yet been determined; but it has, like the partial sweats which have previously occurred, a very sour and peculiar smell. When the sweat has passed off, an extraordinary change is found to have taken place; the hot skin has become cool; the quick and strong pulse is feeble and slow; the feelings of distress and discomfort have disappeared; and in severe cases are succeeded by a state of excessive languor and feebleness, as if the person had been reduced by some immense hemorrhage. After rallying from this, perfect convalescence seems to have commenced, and the yellow tinge begins to disappear, and in four or five days may have altogether vanished. This so called "crisis" is not always accompanied by sweating, a discharge of some other kind may occur in its place, such as diarrhœa, epistaxis, diuresis, or even sometimes menorrhagia.

There seems no doubt that this apparent end of the disease may be the actual one; but in a certain number of cases another phase occurs. After six or seven days of improvement, and (taking the mean) on the thirteenth, fourteenth, or fifteenth day of the disease, the fever suddenly returns. This second attack, the so called "*relapse*," exactly resembles, except it may be in point of severity, the primary attack; the shivering, the severe muscular and articular pains, the restlessness, discomfort, and sleeplessness, the burning skin, the rapid pulse, present themselves over again. If jaundice has not been present in the first accession, it may appear on the second or third day of the second accession. After four or five days, the symptoms begin to improve, the feverishness abates, and, about the twentieth day of the disease, the patient is really convalescent. In an uncertain number of cases, this second accession is terminated by a "crisis" similar to that of the first.

The disease may thus terminate, either gradually or suddenly, and in the greater number of cases it does really so end. In some cases, however, the second accession is not only terminated by a crisis, but this crisis is succeeded at an interval of four or five days by another accession, which may again be followed by crisis, intermission, and a fourth accession. No less than five of these accessions, or *relapses*, have been known to occur.

Various sequences follow this fever, of which the most remarkable are a form of ophthalmitis (well described by Mackenzie), rheumatic-like pains, parotitis (which may also occur during the fever), anasarca, and furunculi.

The disease, whose main features we have thus imperfectly indicated, although comparatively unknown ten years ago, has been so attentively studied by British practitioners, that we are, perhaps, better able to determine the mode of succession and the variation in the symptoms, by means of numerical analysis, than in the case of any other fever.

[With regard to the mortality, it is stated that in uncomplicated cases scarcely any die. Sudden collapse may come on, and in some severe cases the patient dies from ureal poisoning. In other cases, complications, thoracic or abdominal, lead to a fatal result. In 1843, the fatal cases averaged from 2 to 6 per cent. In 1847, 6·38 per cent. A very marked feature in relapsing fever is the frequency of abortion in pregnant women, though this is not invariable.]

The post mortem appearances in this fever need be described no farther than to say, that although in many cases there is congestion of, and in some instances extravasation of blood into and beneath, the mucous membrane of the stomach, and in a less degree of the intestines, yet Peyer's patches remain without deposition and ulceration. The spleen is generally enlarged, and according to Jenner, this occurs more frequently and to a greater extent than in any other form of

fever. Robertson observed also some kind of deposit in the spleen, which he could not identify with the typhoid exudation, but which, like it, underwent a process of softening.

This detail of symptoms must be sufficient to convince any one of the difference between this and other forms of fever. To take only the most striking symptom, the relapse, it appears that this is hardly known except in this disease. In "many hundred" cases (1600 to 2000) of typhus, Henderson has never known a relapse; and Jenner, in his extensive field of operation, has also never yet seen such an occurrence in typhus. In the fever, or variety of fever, termed typhoid, or Dothinenteritis, relapse, as noted by Stewart and Jenner, will occur, but it is exceedingly rare. The majority of the so called relapses in typhus and typhoid fevers, are simply sudden superventions of some complication, or a sudden exacerbation of some previously existing complication, as pneumonia, pleurisy, &c. In 1145 cases of typhus, treated by Perry, in Glasgow, there were nineteen of these so called relapses, which were all traced to some local inflammatory action. But putting the relapse aside, the course of the remaining symptoms is completely dissimilar to that of other fevers; and the absence of the cutaneous eruptions common to other forms is also a strong proof of their non-identity. When to these facts we add the invariable absence of the anatomical sign of Dothinenteritis, viz. the affection of Peyer's patches, the argument against the identity of relapsing fever, and the disease described by Louis, becomes almost absolute; and though the anatomical signs of exanthematic typhus are not so definite, still there are perceptible differences in this case also.

It is therefore not surprising, that the Scotch physicians, who have described the epidemics of 1843 and 1847, should have so unanimously decided on the specific nature of this fever; and the evidence in favour of this view, will, we think, appear to every one sufficiently exact.

But, in addition, another most convincing argument in favour of the same opinion has been recently brought forward by Dr. Jenner, which proves that cases of other forms of fever do not give rise to relapsing fever, and that exposure to relapsing fever gives rise only to a similar disease, and not to another form of fever.

Before passing from the subject of relapsing fever, we may remark, that it can probably return several times in the same subject, and even at intervals of some few months only. In this, also, it shows a remarkable variation from the other English fevers.

Relapsing fever appears to predispose to typhus fever, and to be also predisposed to, by typhus. Steele remarks, indeed, that patients who had formerly suffered from typhus, "enjoyed an immunity from this disease;" but this is contrary to the direct and positive evidence of many other observers.

Contagion, in some instances at least, is admitted by all, except Dr. Craigie, who thinks that "although it is, perhaps, contagious, this is rather a presumption than a well-founded inference." The observations of Douglas and Jenner, however, seem conclusive on this point.

Like other fevers, this disease is influenced in an extraordinary degree by the sanitary condition of the population attacked by it. This has been traced out in Glasgow, with care, by David Smith. Wardell says, this fever "was importantly connected with destitution."

Having thus separated Relapsing Fever from the disease, which it has been customary, in this country, of late years, to call "continued fever," and having shown that the opinion of those who have considered it "a fever, *sui generis*," is justified by its strongly-marked and peculiar symptoms, by its post-mortem characters, and by its not arising (as more fully explained elsewhere) from the causes of the other continued fevers, we are prepared to enter on a further inquiry, the object of which we may present in the following question:—

II. *Is the disease, which, with relapsing fever occasionally added to it, formed the affection termed in this country "continued fever," a single disease, or have two or more affections been included here also under a single term?*

[Dr. Jenner entered systematically into this inquiry in the London Fever Hospital. It has been long known here, that cases of fever with deposit in and under Peyer's patches, and in the mesenteric glands, were common; and so were

cases of fever without any trace of this deposit. Dr. Jenner patiently accumulated nearly 2000 accurate reports. He first separated the cases of relapsing fever, and then instituted a rigorous comparison of the rest.]

It is necessary, however, to state his method more fully, as it appears to us the only one which can possibly solve the question, and it is a model of close observation and logical induction. From the great number of histories of fever-patients he possessed, he selected the fatal cases which had been examined, and the diagnosis of which, therefore, had been confirmed. He found that he had sixty-six such cases and post-mortem examinations. Of these sixty-six, twenty-three had the intestinal and mesenteric lesion, which Louis says is the anatomical sign of typhoid fever, and forty-three were without this appearance. Now, if Louis' doctrine be correct, that no case is typhoid fever unless it presents this appearance, it was to be seen, whether the forty-theee cases in which the intestinal lesion did not occur, differed so much in symptoms and other post-mortem appearances, from those in which it did occur, as to render it impossible to suppose that they were the same disease; or whether, contrary to Louis' opinion, the symptoms were so similar as to lead to the belief that the presence or absence of intestinal lesion was a matter of little consequence. Accordingly Dr. Jenner took these two groups and compared them throughout, and found that while the symptoms and post-mortem appearances of the twenty-three cases were exactly the same as those described by Louis in his great work, the symptoms and post-mortem appearances of the other forty-three cases were entirely different, so different, indeed, as to render their separation from the other cases a matter of absolute necessity, if any certainty was to be introduced into the description of these diseases, and into their treatment. The disease which affected the twenty-three patients, he called after Louis, typhoid fever, and to the other affection he gave the name of typhus. Between these two diseases, no transition forms could be observed. The results arrived at by Jenner agree remarkably with those of Gerhard, Stewart, and others.

If we collate the chief works which have been written on the two diseases by those who have had a full persuasion of their distinctness, we find that typhus and typhoid fevers are said to differ:

1. In the *age* of the patients they affect. Typhus affects all ages, young and old; typhoid, chiefly persons under forty; it will affect older persons, but with difficulty.

2. In their *modes of attack*. Typhus being sudden, typhoid insidious, as a general rule.

3. In their *duration*. Typhus fever is of much shorter duration than typhoid, as has been noted by Gerhard, Stewart, and Jenner. The average duration of Jenner's fatal cases of typhus was fourteen days; of Reid's (143 cases) thirteen days; of the typhoid cases, twenty-two days. In the cases of recovery the difference is just as well marked. The average of 255 typhoid cases noticed by Jackson in Massachusetts was twenty-two days. Hale's average, in the same locality, was thirty-nine days. Jenner's average is from twenty-one to thirty days. The average of non-fatal cases of typhus appears to be much less than this. Jenner states that after twenty-one days, local lesions sufficient to cause death were always discovered in typhus, that is to say, that after this date, death did not occur *from the fever alone*, as may be the case before the twenty-first day. He states the average duration to be from fourteen to twenty-one days; but not infrequently, in very mild cases, it terminates before the fourteenth day, in the same way as mild cases of scarlatina will cease before the average time arrives at which the fever is usually held to terminate.

4. *In the kind of eruption.* Nothing can be more distinct than the repeated scanty crops of rose-spots in typhoid fever, with their bright colour, their disappearance under pressure, and their duration of three or four days, compared with the permanent, dark red, or mulberry coloured, ineffaceable copious rash of typhus. Mistakes sometimes arise, however, from the typhus eruption being seen on the second or third day of its appearance, at which time it disappears under pressure, as was noticed forty years ago by Wedemeyer, in his account of exanthematic typhus.

5. *In the colour of the skin, the expression of the face, and in manner.* Typhus patients often present in its highest degree those characters which the old writers *often* termed "oppression" and "prostration;" the face is darkly and generally flushed,

the complexion muddy, (particularly after the sixth day,) the manner stupid and confused, and the eyes unintelligent. On the contrary, in typhoid fever the complexion does not get muddy, except in a very slight degree; consequently the flush of the cheeks, when present, is bright and pinkish, and not dark red, and it is often circumscribed to the cheeks, and then is strongly contrasted with the surrounding pale skin. The manner, also, is often natural, or even a little sharp, provided there be no delirium. The differences are marked, even in the slightest cases, although in extremely slight cases of typhus the muddiness and flushing may be insignificant compared with the severe cases. In relapsing fever, the complexion is clear, or has a slight yellow or "bronzed look." (Cormack.) It is very conceivable that the peculiar complexion of typhus has not always obtained the attention it merits, on account of the confusion of cases of typhoid and relapsing fever, in which this complexion is not seen.

6. *In the severity and course of the head symptoms.* *Headache* is an almost constant symptom in each. Although there is considerable variation in individual cases, yet on throwing large numbers together, it becomes apparent that both in typhus and typhoid fevers, the *headache* has a determined duration. In typhus it ceases usually on the tenth day, and always before the fourteenth day; in typhoid fever, about four or six days later, and may last till nearly the end of the third week. *Delirium* commences earlier in typhus than in typhoid, by several days. In Jenner's fatal cases, it was more *active* in typhoid; the patients were more vivacious, and disposed to leave their beds. *Somnolence*, although frequently absent in both, is more common and earlier in typhus than in typhoid. The peculiar symptom which has been appropriately called "*coma-vigil*," and in which, as Jenner defines it, "the patient lies with his eyes open, evidently awake, but indifferent or insensible to all going on around him," occurred in one-fifth of his fatal cases of typhus, but in none of the typhoid patients.

7. *In the degree of loss of muscular power.* Typhus patients almost always take earlier to their beds, and are more completely prostrated at an earlier date than typhoid cases. This is well illustrated by Jenner's cases, as here typhus and typhoid cases were lying side by side in the same wards.

8. *In the frequency of epistaxis*, which is very rare indeed in typhus, rather common in typhoid, (one-third of Jenner's available fatal cases; nearly half of Louis'.)

9. *In the condition of the eyes.* In typhus fever the conjunctivæ are generally injected, and the pupils contracted; in typhoid fever, the conjunctivæ are pale, and the pupils larger than natural.

10. *In the state of the tongue*, which is drier, browner, and larger in typhus; is more frequently small, fissured, red, or partially covered with a pale-brown fur in typhoid.

11. *In the chest symptoms.* Sonorous rhonchi are very frequent in typhoid; rare, comparatively, in typhus. Dulness of the depending portions of the lungs, (a little above the bases,) depending on hypostatic congestion, is common in typhus, rare in typhoid.

12. *In the state of the pulse*, which is much more variable in typhoid than in typhus fever.

13. *In the abdominal symptoms.* The abdomen is *painful* on pressure, in about three-fourths of typhoid patients; is almost always quite painless in typhus, or if painful, this is slight and transient. *Gurgling* exists in perhaps a fourth of the typhoid cases; in one fortieth of the typhus. The abdomen is *distended* and *resonant*, more or less in almost all cases of typhoid; it is, with scarcely an exception, natural in shape, or even a little concave, in typhus. *Diarrhœa* exists as a rule in typhoid, as an exception in typhus. *Intestinal hemorrhage* occurs in one third of fatal cases of typhoid; in no case of typhus without dysentery. The *discharges from the bowels* are different in the two diseases; in typhoid they are loose, watery, fawn or dark brown colour, alkaline from fixed alkalies, and contain a large proportion of soluble salts, and a small quantity of albumen. In typhus they are generally solid, often acid, or if alkaline, are so probably from ammonia, and in most cases do not appear altered from health, unless medicines have been taken. Although diarrhœa, meteorism, and abdominal tenderness are the rule in typhoid fever, it must not be supposed that they are always present.

In some of the worst cases, the first abdominal symptom may be announced by peritonitis, consequent on perforation. But when vast numbers are collected, these exceptional cases are lost in the large proportion of those in which these symptoms exist in greater or less intensity.

14. *In the occurrence of epiphenomena and of sequences.* Sloughing from pressure is equally common in both diseases; but erysipelas, phlebitis, and local inflammations and ulcerations are much more common in typhoid fever. So also tubercular deposition in the lungs is decidedly more frequent as a sequence of this disease than of typhus.

15. *In the continuance of the eruption after death.* The spots of typhus last uneffaceably after death; the rose spots of typhoid fever cannot be found.

16. *In the duration of cadaveric rigidity*, which ceases more quickly in typhus than typhoid cases, according to Jenner's interesting observations.

17. *In the more rapid dissolution* (so to speak) *of the tissues* in typhus than in typhoid. As an instance of this, it appears from Jenner's researches that the epithelium detaches itself very rapidly indeed from the basement membrane, a fact which is well seen when a microscopic section of the kidneys of typhoid and typhus patients are examined, or when the surface of the œsophagus is observed. To the same class of facts must be referred the abnormal facility with which, in typhus patients, the pia mater and arachnoid separate from the surface of the brain.

18. *In the frequency of the occurrence of hemorrhage into the arachnoid* in typhus, which occurred in one eighth of Jenner's fatal cases, while it was not found in one of his typhoid cases, nor in any of Louis' or Chomel's cases. The amount of intracervical serosity is also decidedly greater in typhus.

19. *In the frequency of ulcerated mucous membranes in typhoid fever, and the rarity of ulceration in typhus.* In typhoid fever, ulcerations in the pharynx exist in about one third of the cases; but in typhus such lesion is never found, or is excessively rare. In typhoid, ulceration of the larynx and of the œsophagus occurs once in every 15th case; in typhus, ulceration of the larynx happens once in every 26th case; ulceration of the œsophagus very seldom indeed. In typhoid the gall-bladder and the urinary bladder occasionally participate in this ulcerative tendency; in typhus they are never attacked, or very rarely indeed. So also the mucous membrane of the large intestine suffers frequently (in seven of 20 cases, Jenner,) in typhoid; but scarcely ever in typhus, unless there be concurrent dysentery, which is a composite disease, and distinguished without difficulty.

20. *In the concurrence of a peculiar exudation into and under the patches of Peyer, and into the mesenteric glands in typhoid fever.* This is constant in all cases which present the symptoms of typhoid fever; it is never absent, although its amount varies greatly in intensity. After the publication of Louis' work, Andral, Chomel, and others, observed cases which they thought were typhoid fever, without the anatomical sign; but these cases did not bear examination, and subsequent experience has proved that this lesion is constant. It never occurs in typhus fever.

21. *In the greater softness and flabbiness of the muscular tissue of the heart*, in typhus than in typhoid.

22. *In the frequency of lobular and lobar pneumonia in typhoid fever, and the rarity of these local inflammations in typhus.* In typhus, consolidation, or perhaps we should rather say, carnification of the depending portions of the lungs from congestion, is more common, but true inflammation is rare.

23. *In the more frequent occurrence of pleurisy in typhoid fever*, (40 per cent. of fatal cases, Jenner,) than in typhus (55 per cent. of fatal cases.)

24. *In the degree of softness of the spleen*, which is greater in typhoid than in typhus.

25. *In mortality;* that of typhoid being decidedly greater than typhus.

In addition to those differences, there is some evidence of different constitutions of the blood; but as the data are not very exact, we pass them over.

It is also possible that other differences may hereafter be indicated; thus comparative observations have not been made on the urine with sufficient care; the relative temperature of the two fevers, and other points of the like kind, have yet to be considered.

Such is the statement of differences which we have been able to glean from the

writings on the subject. Although some of the distinctions may appear slight and trivial, yet others are not so. Thus among symptoms, the absolute diversity of the eruptions, and the state of the skin, the differences in the duration of the disease, in the mode of onset, and in the pronounced abdominal symptoms of one, with the absence of these in the other, are very marked. So also among post-mortem lesions, the entero-mesenteric disease, the tendency to ulcerations of mucous membranes, and to local inflammations, of typhoid fever, are strongly contrasted with the absence of pronounced local changes in typhus, and with the epithelial separation, apparently from prior injury to structure, which is so marked in that disease. So great are these differences, that we do not hesitate to affirm, if any one will take two confessedly distinct, yet somewhat kindred diseases, such as measles and scarlet fever, and will compare them in the way we have compared these continued fevers, he will not find a stronger case made out for their separation, than for that of typhus and typhoid fevers.

Jenner concludes his comparison in the following way:—

"At the commencement of this analysis, I proposed to examine whether typhoid fever and typhus fever differed from each other in the same way as smallpox and scarlet fever differed from each other; and for the purpose of comparison, I laid down certain grounds, as those on which we founded our belief in the non-identity of the two last named diseases. Those grounds were:—

"1st. In the vast majority of cases the general symptoms differ; i. e. of smallpox and scarlet fever.

"This holds equally true with respect to the general symptoms of typhoid and typhus fevers.

"2d. The eruptions, the diagnostic characters, *if present*, are never identical, i. e. in smallpox and scarlet fever.

"The particulars detailed in the foregoing papers prove that this is as true of the eruptions of typhus and typhoid fever, as those of smallpox and scarlet fever.

"3d. The anatomical character of smallpox is never seen in scarlet fever.

"Just in the same way, the anatomical character of typhoid fever, i. e. lesion of Peyer's patches and the mesenteric glands, is never seen in typhus fever.

"4th. Both, i. e. smallpox and scarlet fever, being contagious diseases, the one by no combination of individual peculiarities, atmospheric variations, epidemic constitutions, can give rise to the other."

III. *Are these differences always well founded, or is it not possible that, existing in well marked cases, they may yet not be constant, but may disappear in some transition cases?*

The assertors of the non-identity state that they have never been able to find any transition forms. Jenner, in London, during the last four years, has seen 2000 cases, all of which could be referred to one or the other form of fever without difficulty. Gerhard and Bartlett, and the other writers on the same side, assert the same thing.

Similar evidence is to be found in that vast mass of instructive matter, which the zeal of the editor of the 'Dublin Medical Journal' has collected. In the history of the terrible Irish fevers of 1846–47 and 48, contained in that excellent periodical, we find the most undoubted evidence, that exanthematic typhus and relapsing fever were the two great scourges, and that typhoid fever, dysentery, and scurvy were here and there intermixed. Frequently, when the writers have been little aware of it, they have given the strongest proofs of the existence of several intercurrent forms of fever.

It should be also remembered that the positive evidence in favour of the non-identity has been gradually accumulating for several years. *Every one who has paid attention to the subject* has adopted the same conclusion. And that the differences between the two diseases are not dependent on any variety of epidemic constitution present in one year, and not in another, is proved by the length of time over which the observations run; Stewart's, Shattuck's and Jenner's paper make up an aggregate period of observation of nearly fifteen years, during which time every one who has attended to the point has recognised these distinctions. In America, also, Gerhard's observations were made sixteen years ago; and every year since that time has more firmly convinced him and other American observers of their accuracy.

When to this strong argument, that the positive evidence is (with one probably unimportant exception) all on one side,—and when, in addition to the fact that Pringle and Huxham, who were so familiar with fevers, distinguished two forms, which it is almost certain were the typhus and typhoid of our own days, and that Armstrong also, more lately, has observed and described two fevers, and that since Louis fixed the symptoms and the post-mortem lesions of typhoid fever, the evidence in favour of the correctness of his views, and consequently of the specific difference between it and other fevers, has been constantly augmenting,—when to all these arguments we are able to add, that if we admit these several forms of fever, the discrepancies between the observations of different countries disappear, order is introduced into this intricate and perplexed subject, and light thrown suddenly on its dark and obscure outlines,—we are strongly impelled to admit at once the truth of Jenner's conclusions, and to separate typhus, typhoid, and relapsing fever, as completely as we do smallpox and scarlet fever.

To the reasons we have above adduced for adopting the doctrine of a diversity of fevers, we are able to add one more, viz., the fact that fever of one form always gives rise, as far as observation at present goes, to a similar disease, and to no other. It was noticed by Henderson, in Edinburgh, that typhus did not arise from intercourse with persons affected with relapsing fever. His conclusion is, "that in not a single instance has the typhus fever presented itself in circumstances that warrant the opinion that it must have been produced by the contagion of the epidemic fever. (Op. cit. p. 218.) The same question has been elaborately argued by Jenner. Typhoid fever produces a like disease, but not typhus or relapsing fever; and each of these two latter diseases produces its own kind, but no other.

We may, therefore, state our answer to the proposed question in the following terms:—The facts adduced in evidence of the specific differences of typhus and typhoid fever are sufficient, if they be hereafter proved to be universal; there is no evidence for the identity of the three diseases, which can be at all compared, in point of precision and extent to that which goes to prove their non-identity; and it is, therefore, excessively probable, strange as it may seem, that the progress of inquiry will soon enable us to decide positively that in the *fever* of Great Britain, diseases the most diverse have been bound together by the enthralling yoke of a simple name.—*Brit. and For. Med. Chirurg. Review, July* 1851, *p.* 1.

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## 2.—ON THE EFFICACY OF LARGE AND FREQUENT DOSES OF QUININE IN ARRESTING THE COURSE OF CONTINUED FEVER.

By Dr. Robert Dundas, Physician to the Liverpool Northern Hospital.

[Early in the present year Dr. Dundas explained his views on the pathology and treatment of tropical fevers, and in which he stated his belief that the continued fever of this country was the same as that of the Tropical countries, and curable by the same means. Acting then on this conviction of the identity of the remittent and intermittent fevers of the tropics with the typhus fever of this country, and being aware of the specific action of quinine in every stage of the former diseases, Dr. Dundas has resorted to the administration of quinine in all stages of the typhus of this country, with the happiest results. He says,]

In typhus, as in the remittent and intermittent of hot climates, the treatment by quinine will be successful in proportion to its early administration; also, as in the tropical fever, the doses should be large—ten or twelve grains,—and repeated at intervals not exceeding two hours. Three or four doses will, in most cases, be sufficient to exert the specific influence of the medicine, which is displayed by dizziness of the head and tinnitus aurium, or in the rapid subsidence of all the urgent symptoms. In the latter event, three grains of quinine, or some vegetable bitter infusion, should be administered three times a-day, and the patient supported with some good beef-tea or other light nutriment, and wine, if necessary. Should the urgent symptoms return, the large and repeated doses of quinine must be again resorted to. Slops should be avoided, and purgatives also, unless obviously indicated; but an emetic of tartarized antimony, when the *prima via* is loaded, will often prove useful at the commencement, and seems to render the system

more obedient to the specific influence of the remedy. Should the urgent symptoms persist, notwithstanding the administration of four or five doses of quinine; or should dizziness of the head and tinnitus aurium supervene, the medicine must be discontinued; and after an interval of six or seven hours, small and repeated doses of tartarized antimony should be resorted to, until full vomiting is induced. The patient should then be allowed to rest for twenty-four hours, when the quinine should be re-commenced as before. If the symptoms still resist, the remedies may be repeated in succession, as above stated, for a period of four or five days; and, unless the beneficial effects are broadly marked within that time, we can no longer reasonably hope for success from this treatment, and it must be abandoned. Still, in the great majority of cases of uncomplicated typhus, taken at the commencement, complete and rapid success may be calculated on; and, in all, the diseased chain of actions will almost invariably be broken—no unimportant advantage in the treatment of any malady. In the advanced periods of the disease, the results will be much less certain; but, in all stages, the large doses of quinine may be safely resorted to, and will commonly calm the patient, cool his skin, allay the headache, and reduce the frequency, and improve the character of the pulse. It must, however, be borne in mind, (as I have elsewhere pointed out,) that any vital organ being seriously involved will prove a disturbing cause to the curative powers of the remedy, which are clearly exerted on the nervous system, through which the blood and secretions are favourably modified, and often with marvellous rapidity.

In the history of typhus in this country, numerous incidental notices will be found, such as the following on the epidemic of 1819:—"The disease has simulated the recurrent type; the paroxysms were marked by distinct and often violent rigors, which were succeeded by intense heat, and increased vascular activity, terminating occasionally in profuse sweating, but more commonly in gradual subsidence of the exacerbation, without any relaxation of the surface. The paroxysms showed no obedience to periodicity; in some cases recurring in a few hours, and, in others, only after a lapse of as many days." Now, here we are presented, clearly and distinctly, with the history of an irregular intermittent or remittent fever; yet, strange to say, this idea seems never once to have crossed the mind of the observer.

As I well know, by experience, how distasteful an array of cases commonly proves, I shall only relate two or three; but these are well adapted to illustrate, beyond all rational doubt, the justness of the principles and the efficacy of the treatment which I have just inculcated. The cases are divested of all minute detail, as I am anxious to place the broad facts clearly before the Profession, so that they may be easily impressed on the memory, and in order that they may be submitted to large and careful experiment. The two cases now to be related were received into the Liverpool Northern Hospital, one under myself, the other under my colleague, Dr. Scott. The notes were taken by our intelligent house-surgeon, Mr. Evans, and are given in his words:

"*Case* 1.—Cornelius Vincent, aged 26, was admitted October 2, 1850, into Ward No. 12, under Dr. Dundas.

"October 3.—He had been ill ten days. Present state: severe headache; anxious countenance; slight delirium; skin hot and dry: tongue black, dry, and furred; teeth covered with sordes; thirst; urine scanty and high-coloured; bowels open; pain of abdomen on pressure; pulse 100; respirations 28.

"℞. Disulphas quinæ, gr. xxx. Divide in doses iij., quarum capiat unam secunda quaque horâ.

"October 4.—*Convalescent.* The pain in the head and the delirium have ceased; the abdomen is less tender; the heat of the skin diminished; the tongue clean and moist; pulse 90; respirations 24.

"℞. Infusi quassiæ, ℥ iii., ter in die.

"No further treatment was resorted to, and from this date he rapidly gained strength, and was discharged well on the 11th October.

"It is the ordinary rule not to admit cases of typhus into the Northern Hospital, but to send them to the Fever Hospital. The above case, however, having been reported to my colleague, Dr. Scott, he resolved to give the treatment by quinine another trial. An opportunity presented itself in a few days.

"*Case* 2.—Edward Donald, aged 23, was admitted on 25th October, 1850, into Ward 14, under Dr. Scott. He had been ill eight days. Present state: great anxiety of countenance, and high delirium; dry pungent skin; tongue dry, and coated with dark fur; sordes about the lips and teeth; great thirst; urine scanty and high-coloured; bowels open; abdomen tumid, and tender on pressure; pulse 108; respirations 30.

"℞. Disulphas quinæ, gr. xxx. Divide in doses iij., quarum capiat i. secunda quaque horâ.

"October 26.—*At the morning visit, he was found reading a book in bed!* All the formidable symptoms of yesterday have disappeared. No further medical treatment was resorted to in this case, and he was discharged well on the 5th November.

The same treatment has been adopted in several other cases of fever admitted into the Northern Hospital, and with equally good success. In one case, that of Ann Dobbin, one of the hospital nurses, the effect was highly instructive. Attacked with well marked typhus, she was treated for three or four days on the ordinary routine system, by purgatives, salines, and diaphoretics. Under this treatment, she daily became worse; the cerebral disturbance, lumbar pains, heat of skin, and thirst gradually became more intense, the pulse more frequent, the tongue dry and brown, and sordes began to appear about the teeth and lips. Ten grains of quinine were now given every two hours, with the result, after the sixth dose, of arresting all the unfavourable symptoms. The pulse calmed down; the tongue became moist and clean; the sordes disappeared; the heat of skin, thirst, cerebral and lumbar pains, all moderated, and she rapidly improved without any further medical treatment beyond the administration of a little wine.

[Knowing that Mr. Eddowes, of the Liverpool Fever Hospital, had treated typhus cases with quinine, Dr. Dundas enquired of him the results. The following is from Mr. Eddowes' reply.]

"I have used it, during seven weeks, in every case of typhus, giving five grains every three hours; and the success has been most marked.

"The day but one after its administration generally finds the patient better; the petechiæ gradually fade, and the fever leaves its unhappy victim.

"In diet, I give milk, arrow-root, and beef-tea; also wine, if necessary.

"The superiority of your plan of treatment consists, I believe, in the simple fact, that it either *cuts the fever short, or prevents the accession or increase of the more formidable symptoms;* while, in the ordinary treatment (the *médicine expectante*), the physician only interferes when death is on the point of claiming the sufferer for his own.

"The cases in which I have used the quinine have been eruptive typhus,—not a single case of typhoid fever.

"The quinine frequently excites vomiting of a grass-green liquid; but I do not discontinue it on that account."

I have subsequently had two interviews with Mr. Eddowes at the Fever Hospital, when he kindly permitted me to verify the results of the practice by a personal examination of his patients; at the same time declaring, in emphatic terms, his sense of the importance of my system, and of its vast superiority over all others heretofore resorted to in the treatment of typhus fever.

It will be remarked, that the improvement in the patients at the Fever Hospital was generally apparent only on the third day from the commencement of the remedy; whilst, in my own patients, the improvement is generally established within the first twenty-four hours. Mr. Eddowes, however, it will be observed, did not push the remedy to its full extent. He administered only five grains every three hours, instead of ten grains every two hours, as I have recommended; and this, I believe, will satisfactorily account for the slight difference in the results. He at the same time informed me—and allowed me to state the fact—that, from the high price of quinine, and the large number of patients in hospital, he was induced, by motives of economy alone, to try first the effect of the smaller doses. As regards the question of economy, very properly adverted to by Mr. Eddowes as a public officer, I am satisfied that if the plan of treatment in typhus, now laid before the Profession, be adopted by public institutions, its superiority to all systems hitherto practised will be at once manifested; and not alone in the

economy to human life and suffering, but—what is scarcely less esteemed in this economical age—by the vast pecuniary gain to the public from the rapidity and certainty with which typhus may be arrested—CURED, *malgré* Pitcairn—and the patient thus restored to his ordinary occupation, ceasing to be a burden on the funds of the community.

Yet, we are told, on high authority, that "in the continued fevers of this country. we believe it (bark) might with great safety be erased from the list of remedies altogether." Another author of acknowledged eminence, Dr. Pereira, in his standard work on Materia Medica, lays down that, "in febrile conditions of the system, attended with a hot and dry skin, and a furred and dry tongue, tonics act as local irritants and stimulants, and add to the severity of all the morbid symptoms,"—p. 208; and he illustrates his doctrine by the action of disulphate of quinia in fever! Again, Dr. Watson, deservedly one of the highest (as well as the most recent) authorities in medicine, adopts, in its fullest extent, the well known maxim of Pitcairn,—"You may *guide* a fever; you cannot *cure* it."

When these high-vouched theories are measured by the facts which I have just stated, all of which have also been observed by others, I feel convinced that, however distinguished the names which have sanctioned these doctrines, they will be proved to be utterly unfounded. So fatal, indeed, are they, that, when we take into account the extent and mortality of fever in all its forms, in every clime, and in every class, I question whether their application to the actual treatment of human disease will not outweigh, in danger to health and life, all the advantages to be derived from the more enlightened views of modern medicine.

The cases which I have related, even if they stood alone, which they do not, would afford cogent evidence, not only in support of the treatment adopted, but of the truth of the doctrine on which such treatment is founded,—viz., the essential identity of the typhus of this country with the intermittent and remittent of the tropics, modified by climate and numerous other influences. In fact, I believe that the history of fever must, and will ere long, be rewritten.

The power of quinine in controlling the remittent and intermittent fever (and the yellow fever also, as stated by Dr. Blair), is now a well-established and important fact; although I totally dissent from the received doctrine of its specific action on the *several specific poisons* which originate these fevers. Moreover, I have demonstrated, that, in sufficient doses, it displays an equal power in subduing the supposed animal poison of the typhus fever.

The action of quinine is clearly not that of a tonic, in the ordinary sense of the word; its action is obviously on the nervous power, whose functions it favourably and rapidly modifies, when depressed or exhausted by any of the numerous moral or physical agencies which act in causing fever, and thus it restores to the organic nervous system its normal influence over the animal fluids and vital phenomena. Hence the curative powers of quinine in fever, and in many other apparently dissimilar maladies.—*Med. Times, Oct.* 4, 1851, p. 346.

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## 3.—ON THE NATURE AND TREATMENT OF HAY-FEVER.

By DR. F. W. MACKENZIE, Physician to the Paddington Free Dispensary, for the Diseases of Women and Children, &c.

[Although we do not know in what the peculiar susceptibility consists, it is nevertheless certain that the respiratory mucous membrane is in some persons peculiarly susceptible to certain impressions, and readily disposed to take on morbid action in consequence. But although the symptoms and exciting causes may differ in many cases, yet they depend upon the same proximate cause, and are amenable to the same general principles of treatment. With regard to the pathology and treatment of hay asthma, it may be remarked that little is known; and in many cases all treatment has proved of no avail. From the state of the mucous membrane, in the case of a gentleman who consulted Dr. Mackenzie, he was led to employ arsenic, from the analogy which appeared to him to subsist between its pathological condition and that of the skin in some forms of prurigo. The result is described as follows:]

Mr. A. S. had for many years suffered during the summer months from hay-

asthma, or rather catarrh; but his present attack had been of unusual severity, partly from the extreme dryness of the season, and partly from his having been obliged to live a great deal in the country during the summer, and consequently much exposed to the emanations from hay and grass. He had been suffering from this attack for many weeks before I saw him, and its severity had told painfully upon him. The whole of the respiratory surface, from the frontal sinuses to the bronchi, was excessively irritable, and in some parts inflamed; the eyes were blood-shot and suffused; the nose painful and tumid, and the nostrils inflamed and almost excoriated; his throat was dry and rough, and throughout there was a copious defluxion, with lachrymation and coryza. In addition to the local, the constitutional symptoms were severe. The pulse was quick, the skin hot, the tongue furred, the appetite bad, and the secretions from the liver and intestines scanty and unhealthy. The patient was restless at night, and had very little uninterrupted sleep. The continuance of these symptoms had very materially changed his appearance; he had become emaciated, pale, and haggard, and altogether was in a very pitiable condition.

Having learnt that he had consulted many persons, and taken various remedies without benefit, and having no particular treatment to suggest, I had intended leaving without prescribing, but it struck me, during my visit, that there was a close resemblance between the state of the respiratory mucous membrane in his case, and that of the skin in some forms of prurigo; and having often seen the beneficial effects of arsenic in the latter affection, I was led to think that it might be serviceable in the present case. Thus, in both cases there appeared to be a peculiar or specific irritation of their respective surfaces. Both appeared to depend primarily upon nervous rather than upon vascular disturbance, and each to consist essentially in an exaltation or perversion of nervous action,—the one of the organic, the other of the sensory nerves. Impressed with this view, I recommended a trial of this medicine. It was commenced on the 11th of July, in five minim doses of Fowler's solution three times a day; and by the 16th nearly every vestige of the complaint had disappeared. The patient, however, was so sceptical in regard to medicine that he was unwilling to believe that his improvement was attributable to it. He rather thought that the complaint had worn itself out, and this view was favoured by the lateness of the season: my own impression was otherwise; but I was willing to let the matter rest, to be decided by further investigation.

During that year, I saw no other case of the disease; and it was not until the following summer that I was enabled to make any further observations in regard to it. I had then the opportunity of trying the medicine in several cases, and in all with encouraging success. A professional friend, whose experience and judgment are very great, has also given it, at my suggestion, with much benefit: and it has been given successfully by a practitioner of extensive practice in the country. These facts, so far, are favourable to its employment in these cases; and it is with the view of drawing attention to it, and of eliciting the results of more extended observation, that I am led to publish the present communication.

Of the precise pathological nature, or the proximate cause of hay fever, we are, as has been stated, altogether unacquainted; and we are therefore unable to deduce from a consideration of it any satisfactory method of treatment, and so far must be content to adopt either empirical measures, or such as analogy may suggest. I have remarked that the more obvious symptoms of the disease appear to depend upon, or to be connected with, a morbid irritability of the organic nerves of the respiratory mucous membrane; and that in this respect it presents some analogy to a kindred affection of the skin, characterised by extreme irritability of the cutaneous nerves, and one at the same time in which arsenic is extremely efficacious. Upon this ground, I was more particularly first led to employ it; but there are other considerations which recommend it to our notice. In the first place, the *origin* of this complaint is very similar to some in which it has been given with much benefit, such as remittent and intermittent fever, neuralgic affections, and some forms of rheumatism, which, in common with hay-fever, are traceable to malaria, miasmata, or vegetable effluvia of various kinds; whilst in the more specific actions peculiar to these, and in the morbid condition of the nervous system which prevails, we see much that is analogous in all. But independently of these more specific diseases, we have many and undoubted proofs of the utility

of arsenic, in correcting or controlling irregular nervous actions, and morbid conditions dependent upon them; and its remedial powers in chorea and epilepsy, in prurigo, lepra, psoriasis, and many other cutaneous diseases, may be cited in illustration. Within certain limits, most writers agree in considering it as a tonic; and as such, its action is especially marked upon the skin and the mucous membranes. An eminent practitioner remarked that, for strengthening and giving tone to the former, he knew of nothing equal to it; and in regard to the latter, it has evidently a specific action upon that of the whole respiratory tract. Hence its administration, when given too largely, or for too long a period, is occasionally followed by redness and irritation of the eyes and eyelids, coryza, dryness of the throat, cough, and symptoms of pulmonary irritation; and, on the other hand, in moderate doses, it has been given beneficially in various irritable and morbid conditions of this membrane, such as is met with in asthma, hooping cough, catarrh, ophthalmia, &c.

Mr. William Simmonds, of Manchester, gives the following report of its employment in hooping cough, in a letter to Dr. Duncan, published in the second volume of the 'Annals of Medicine for 1797, p. 393. "For upwards of three years, I have given arsenic in the hooping cough with the most salutary effect. In general, it has put a stop to the disease in about a fortnight; and it has never failed to moderate it in a few days. I have administered it in one unsuccessful case only, and even then it afforded considerable relief; and had I been called in earlier, or had I been permitted to pay the attention the case required, I am of opinion that it would have succeeded in that also. I have used it in the form of the mineral solution of Dr. Fowler; and in the dose, and with the precautions recommended by him in his work on Intermittents, &c., children of a year old may take it with safety. Previous to, and during its use, bleeding, blisters, and emetics may be employed, according to the indications, particularly the latter. It should be continued until the disease is subdued; and then leaving it off for a week, it should then be had recourse to for a week, to prevent a return. Should exposure to cold occasion a relapse, it has hitherto put a stop to it, upon being taken for a few days."

In some forms of ordinary catarrh, I have myself given arsenic with the best results; but more especially in those cases in which the affection has been of a local character, and there has been an absence of inflammatory action, as well as of febrile disturbance. These circumstances forbid its employment; and it is because they so frequently occur in connexion with catarrhal complaints, that it is for the most part inappropriate. Where, however, there is irritation of the mucous membrane rather than inflammation, as is especially the case in hay-fever, it may be employed with much advantage, as is shown in the following instances:

*Case.* Rebecca Lord, aged 45, applied at the Paddington Free Dispensary, October 8th, 1850, suffering from catarrhal symptoms—sneezing, coryza, lachrymation, cough, and slight fever; tongue furred and unpleasant; bowels open.

℞. Liq. pot. arsenitis 3 j; vini ant. tart., vini ipecac., liq. potas. ää 3 iiss; aquæ distil. ad ℥xij., M. Fiat mistura cujus sumatur ℥j ter die.

On the 11th she was perfectly well; all the catarrhal symptoms had left her. She took eight doses of the mixture; but in twenty-four hours she was relieved of all uneasiness of the mucous membrane.

*Case.* Mary Ann West, aged 15, applied at the Paddington Free Dispensary, July 26th, 1850, suffering from catarrhal symptoms—coryza, lachrymation, defluxion, cough, sore throat, and slight febrile disturbance.

℞. Liq. pot. arsenitis ♏ iiij; liq. potassæ ♏ x; aquæ distil. ℥iss. M. Ft. haust. ter die sumendus.

July 30. She was free from all catarrhal symptoms, and felt perfectly well.

*Case.* Margaret Liddon, aged 55, applied at the Paddington Free Dispensary, August 13, 1850, suffering from catarrhal symptoms, together with constrictive pain of the chest, dyspnœa, and cough. She had been troubled with these latter symptoms for some time: throat dry; tongue unpleasant and furred in the morning; bowels constipated; appetite bad.

℞. Liq. pot. arsenitis ♏ xxv; liq. potassæ 3j; tincturæ hyoscy. 3ij; aquæ distil. ad ℥viij. M. Fiat mistura cujus sumatur pars sexta ter quotidie. Sumat pil. hydrarg. gr. v.

August 23rd. She was entirely relieved of cough and all pulmonary irritation.

In catarrhal ophthalmia, and more especially in those forms which are of a passive, subacute, or chronic character, or where the irritability of the conjunctiva is excessive, arsenic has a very beneficial effect. I might subjoin cases in illustration of this fact, were it not well known to oculists, and referred to in systematic treatises on diseases of the eye.

Lastly, in intermittent headaches, brow ague, cephalalgia, and other affections in which the mucous membrane of the frontal sinuses appears to be the seat of pain, arsenic has proved efficacious. These facts are all of importance, in connexion with the subject of the present communication.

The cases of hay-fever in which I have seen it most serviceable have been of a catarrhal rather than of an asthmatic character; and I have given it, on an average, in doses of five minims of Fowler's solution three times a day. Where, however, the attack has been slight, or the medicine has been given with the view of improving the tone of the mucous membrane rather than of correcting morbid action, three-minim doses, or even less, are preferable; whilst, on the other hand, if the irritation has been excessive or resists these, larger doses may be given, and their action modified or assisted in different cases by remedies of a kindred character.

Dr. Fowler, to whom we are indebted mainly for our knowledge of the efficacy of the medicine, was in the habit of prescribing it much more largely than is done at the present day. To adults, he gave his solution in doses averaging from ten to sixteen minims twice or thrice a day. He mentions that fifty minims were taken by mistake, within the space of nine hours, by a patient, without any very serious consequences ensuing; and that, in one case, twenty drops were taken three times a day, with speedy and permanent advantage.

Dr. Brown, ('Cyclopædia of Practical Medicine,' vol. ii., p. 288,) who gave it in many hundreds of cases, states that he never saw any permanently ill effect arise from it. These facts are adduced, as showing the harmlessness of the medicine when properly given, and as meeting an objection which might otherwise be urged against its use.

Arsenic is best given, in this affection, in moderate doses, and I should propose smaller than those recommended by Dr. Fowler, whose experience led him to lay down the following rules for its administration: "Patients from two to four years," he says, "may take from two to four drops of the solution; from five to seven years, may take from five to seven drops; from eight to twelve years, may take from seven to ten drops; from thirteen to eighteen, may take from ten to twelve drops; and from eighteen and upwards, may take twelve drops as a dose." He advises that doses proportional to the age of the patient should be administered three times a day for five days; then omitted for two or three days; and then repeated for three days, to prevent a relapse. These doses are mentioned with especial reference to the cure of intermittent fevers. They are much too large for the cases under consideration; for which, from one to five minims of the mineral solution may be considered as an average dose, and beyond this it will seldom be necessary to carry it, while positive harm may result. Seeing, indeed, that the state of the mucous membrane is one of morbid susceptibility to impressions, and that the medicine has a specific action upon it, it is important to keep within due limits and so avoid any severe or unfavourable reaction.

When the medicine alone fails to do good, its use may be alternated with quinine, or the two medicines may be given concurrently. Dr. Fowler found this practice successful, in the treatment of intermittent fevers, when either bark or arsenic, singly administered, failed to remove the disease. He observes: "if the solution and Peruvian bark have been given separately, and have failed, it will sometimes be advisable to try the joint power of the medicines at the same time, but in doses rather smaller than usual. In these cases, the solution should be given at stated hours three times a-day, and the Peruvian bark may either be given combined with it, at the same periods, or between the fits, in as frequent doses as the stomach can bear." Another useful addition to arsenic, when the irritation of the mucous membrane is severe, or the stomach is unpleasantly affected by it, is opium, in small doses; indeed, its general employment in conjunction with arsenic has been recommended by many practitioners, as being calculated to render its action not only more certain, but less disagreeable to the stomach; and in cases

like the present, where the irritability of the part more immediately affected is excessive, its use is otherwise appropriate. It is best given in small doses, not exceeding two or three minims of the tincture or of Battley's solution; and should it derange the stomach, or interfere with the secretory functions of the liver or other organs, some other sedative may be substituted. I have seen very favourable effects from the Indian hemp in cases of morbid irritability of the nervous system, and these would lead me to recommend a trial of it in the present disease. The most efficacious preparation is the ætherial tincture.

Lastly, when the irritation is most marked in the pulmonary portion of the mucous membrane, and the symptoms are of an asthmatic rather than catarrhal character, ipecacuanha, antimony, squill, or some other expectorant, may be given concurrently with it, if circumstances indicate the employment of such remedies.

But in addition to the more specific treatment of the disease, much may be done in the way of prevention, by invigorating the nervous system, and improving the tone of the respiratory mucous membrane; and measures that fulfil these objects should be perseveringly employed by persons who are subject to these attacks. In particular, the daily use of the shower bath, the application of cold locally to the chest, neck, and shoulders, and the use of cold collyria and gargles, may accomplish much good. The diet and regimen also should be subservient to these ends; and if there exist an undue irritability of the nervous system, depending on a defective condition of the blood, steel in some appropriate form should be given.

I would further observe, that when the disease is fully developed, and the irritability of the mucous membrane is very great and distressing to the patient, it may be very much mitigated by the occasional application of the vapour of warm water. By holding the face over a large basin of boiling water, and retaining the steam by means of flannel thrown over the head and shoulders, it is readily and directly brought in contact with the whole respiratory branch, and affords very striking relief to the irritation which exists. Of medicated vapours I have no experience; nor have I seen any benefit derived from the topical application of lotions of the nitrate of silver, &c. Indeed, seeing that the disease is seated rather in the nervous system than the mucous membrane, I should anticipate less benefit generally from local than from constitutional treatment.

These, then, are the principal points to which I would direct attention, in the treatment of hay-fever:—1. to preventive measures, comprehending, more particularly, tonic treatment in every available form, both local and constitutional; 2. to specific treatment, comprising more especially the administration of arsenic, and modified or assisted in the manner proposed, according to the requirements of individual cases; 3. and lastly, to soothing or palliative treatment, which is not inconsistent with the former, but may be advantageously combined with it.—*London Journal of Med., July*, 1851, *p.* 637.

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4.—*On the Use of Colchicum in the Delirium and Coma of Scarlatina*—By Professor Bennett, Edinburgh.—A boy, aged 14, entered the clinical ward on the third day after experiencing distinct rigors. There was restless delirium, and constant moving of the head from side to side upon the pillow. He was apparently conscious when spoken to, but could not answer questions—the tongue was protruded with difficulty, dry, and of bright red colour, studded with florid elevations—deglutition was much impeded—bowels open—pulse 130, weak—urine voided with difficulty, and diminished in quantity—sp. gr. 1025—not acted on by heat and nitric acid—skin hot and dry, covered with the bright red scarlatinal eruption.—*Ordered salines and slight diuretics.* He continued in the same condition, the angina, coma, and alternating delirium, however, being more pronounced until the sixth day. During this period all the urine passed was carefully examined. The amount was diminished (17 oz. per day), but it was free from deposit, and unaffected by heat or nitric acid.

℞. Sp. æther. nit. 3 iij; pot. acet. 3 ij; tr. colchici ℥ ss.; aquæ ℥ iij. Ft. mist.
A teaspoonful to be taken every four hours.

On the following day all coma and delirium had disappeared. He answers questions when put to him—skin cool—eruption faded—pulse 96, weak—passed 30 oz. of urine, which is turbid, with small flakes of a membranous character floating in it. On the 8th day the quantity of urine excreted was 50 oz., and it was still more loaded with sediments. On examining the urine with a microscope, it was seen to contain—1st, membranous flakes, composed of aggregated rounded particles, apparently agglutinated together, and strongly resembling some forms of vegetable tissue—2d, rounded and irregular masses with spicula—3d, amorphous molecular masses. The whole of these elements, on being analysed by Mr. Drummond, were found to consist of urate of ammonia. Next day the urine was only slightly turbid, and on the following one, was perfectly clear. From this time the boy gradually recovered.

*Commentary.*—This was a very severe case of scarlatina. The angina was intense, occasionally rendering deglutition impossible. There was delirium on the third day, alternating at night with coma, which was often profound. The worst result was apprehended. It recurred to me that the head symptoms in this as in several cases of typhus, might probably depend not so much upon inflammation of the brain, as is generally supposed, as upon absorption of, and poisoning by urea, an idea that appeared to me supported by the diminished quantity of the renal excretion, as well as its freedom from all deposit. Remembering the alleged virtues of colchicum in increasing the elimination of this excretion, I ordered it, in combination with diuretics, and the result was remarkable. For on the next day, not only had the fever diminished, but the urine was increased in amount and loaded with urates to an extent and in a form I had never previously seen. It may be argued that the fever had terminated by a natural crisis on the seventh day; but I cannot help thinking that in this case nature was assisted by the colchicum and diuretics. At all events, this medicine seems to me worthy of more extensive trial in scarlatina accompanied by diminution of urine and head symptoms.—*Monthly Journal of Med. Science, August* 5, 1851, *p.* 158.

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5.—*On the Internal Administration of Belladonna in Scarlet Fever.*—By Benjamin Bell, Esq, Edinburgh.—[Some favorable cases occurring in George Watson's Hospital, Edinburgh, Mr. Bell determined to test the alleged prophylactic virtues of the belladonna, and to give it a full and fair trial. He says:]

On the 21st of February, upon the appearance of a second case of scarlet fever, the fifth part of a grain of the extract was given, morning and evening, to each of the boys. The dose was found in a few days to be too large, from the dilated state of the pupil and impaired vision which it occasioned in several instances. It was accordingly diminished, and then administered without interruption, to all the boys who continued well, until the 7th day of June,—a full month after the last case of scarlet fever had occurred. It is important to remark, that the second case already referred to had been in the sick-room, separated from the rest of the boys, for more than a week before the symptoms of scarlet fever appeared, and that no additional case occurred until the 21st of March, an entire month after the belladonna had been regularly administered. There was thus ample time for the manifestation of its virtue as a prophylactic; but the subsequent occurrence of so many cases seems to throw considerable dubiety over the existence of any such power. No experience of a merely negative character can be regarded as of much weight, when contrasted with this positive experience now detailed. It is by no means unusual to meet with only two or three cases of scarlet fever, in a large assemblage of children, without the belladonna having been used at all; and, therefore, we are not called upon to give it the credit of securing a similar exemption in cases where it has been administered; but, surely, the occurrence of twenty-three cases out of fifty-four boys, who might be legitimately reckoned liable to the disease, is an overwhelming evidence on the opposite side.

Possibly, the administration of the drug may be useful in some cases, by inspiring confidence, and so indirectly fortifying the system against contagion; but we cannot divest ourselves of the impression, that the continued use of a narcotic for weeks together, even in small doses, must be prejudicial to health; and that thus,

while failing to defend the individual against infection, it may render him less able to cope with the disease when it really comes. Certainly, a large proportion of the boys who took the belladonna, seemed to have more or less furring of the tongue, impairment of appetite, and other evidences of slight indisposition.—*Monthly Journal of Med. Science, August*, 1851, *p.* 107.

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6.—*Scarlatina.*—Dr. Volz has recorded his experience of a severe epidemic o scarlatina in Carlsruhe, from which he draws the following deductions:—

1. The extent and redness of the eruption are not in direct ratio to the severity of the disease.
2. The proximate cause of the exanthem is a stasis in the cutaneous capillaries.
3. The exfoliating scales of epidermis do not transmit the contagious principle of the disease.
4. The mucous membranes undergo the scarlatinous eruption equally with the skin.
5. The lesions of the throat are of three varieties,—catarrhal, inflammatory, and gangrenous.
6. The inflammation of the parotid which accompanies scarlatina seldom terminates in suppuration; that which follows the subsidence of the exanthem, often suppurates.
7. In the consecutive anasarca the alterations in the kidney are secondary, and depend on the change in the composition of the blood.
8. Death may occur in scarlatina from the following causes:—congestive apoplexy, suffocation, pyæmia, and anæmia.—*Prov. Med. and Surg. Journal, June* 25, 1851, *p.* 359.

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## 7.—ON LEUCOCYTHEMIA.

By Professor Bennett, Edinburgh.

[In the first article of our last volume (vol. 23) the reader will find a very interesting paper on the subject of white cell blood (Leucocythemia), which is a proper introduction to the present one. Professor Bennett has established the existence in the blood of an excess of the colourless corpuscles; a condition highly important to the pathologist and physiologist. He says:]

The blood may be loaded with a multitude of cells, exactly resembling those of pus; that such blood may circulate in the human subject for months, or even years, without destruction to life, and that this condition is always associated with disease in those organs, the functions of which have hitherto been involved in the greatest obscurity, constitute facts which seem calculated to exercise an important influence on many views that have been long agitated in science. The constitution of the blood itself; the origin of its morphological elements and chemical proximate principles; the importance of the lymphatic system; the functions of the spleen and other blood glands; the nature of purulent infection, and other diseases of the blood, may be expected to be more or less elucidated by a study of the accompanying phenomena, causes, and results, of leucocythemia. With a view, then, of stating as succinctly as possible the conclusions which may be legitimately derived from the thirty-five cases previously recorded, I shall divide this part of the inquiry into several sections, in which all these important topics will be shortly considered.

I. *Symptoms observed in individuals affected with Leucocythemia.*—The symptoms have been very carefully observed in several of the cases recorded in the first part of this memoir, but we have great difficulty in referring any of them to the mere alteration in the blood. Several of those which were most constant and best marked in advanced cases, were apparently caused by the increased size of the spleen or liver, as they have been seen to occur in other cases where these organs have been enlarged, without the occurrence of leucocythemia. No doubt the peculiar change in the blood of which we are treating has been discovered in individuals affected with enlarged spleen; but this may arise from the circumstance,

that the circulating fluid has been more frequently examined in persons labouring under that complication. When leucocythemia, however, is more generally studied, it will very probably be found associated with enlargement in other organs, especially of the thyroid, thymus, supra-renal capsules, and lymphatic glands. Hence, I am persuaded, no systematic history of the symptoms connected with this morbid state can be given in the present state of our knowledge; and I shall therefore merely content myself with an analysis of those observed in the cases recorded.

Of the thirty-five cases which are given in the preceding pages, leucocythemia was demonstrated to exist, by careful microscopic examination, in twenty-five. The facts presented by these may be afterwards compared with those offered by such cases as were doubtful, or by those in which, associated with large spleen, it was proved that the blood was quite healthy.

*Sex.*—Of the twenty-five cases, sixteen occurred in males and nine in females.

*Age.*—The youngest case in which leucocythemia was observed was in a girl aged 9, and the oldest in a woman aged 69 years. In two cases the ages are not stated, but in the remaining twenty-three they may be arranged as follows:—Under 10 years, one case; between 10 and 20, two cases; between 20 and 30, three cases; between 30 and 40, seven cases; between 40 and 50, four cases; between 50 and 60 three cases; and between 60 and 70, three cases. So far as this analysis goes, the diseases would appear to be most common in adult life, and more frequent in advanced age than in youth.

*Abdominal swelling.*—Greater or less swelling of the abdomen was present in twenty out of the twenty-five cases,—evidently dependent, in the majority of these, on enlargement of the spleen and liver, singly or united. In five cases ascites was also present. In several of the cases there was more or less abdominal pain or tenderness, while in a few the enlargement only produced inconvenience, from its size or weight.

*Respiration.*—The respiration was more or less affected in twelve out of the twenty-five cases. Of these dyspnœa existed in eight. The respiration is said to have been hurried in one; short in a second; laborious in a third; and slow in a fourth. The disordered respiration appeared to be dependent in some cases on enlargement of the abdomen, and corresponding compression of the pulmonary organs, in others (five cases) it may have resulted from disease of the lungs themselves.

*Vomiting* was present in seven cases. In two at the commencement, in three it was occasional, in one there was hematemesis, and in one it was connected with ulcer of the stomach.

*Diarrhœa* was present in twelve cases, and in some was the leading symptom throughout the progress of the disease. In Tinlay, for instance (Case 2), during the six months he was in the Infirmary, the bowels were opened from eight to twelve times a-day for weeks together. In other cases this symptom only came on latterly, and in a few was not urgent.

*Constipation* is said to have existed in five cases.

*Hemorrhages.*—Extravasation of blood occurred in fourteen out of the twenty-five cases. Of these there was epistaxis in six cases; hematemesis in one case; hemorrhage by stool, including hemorrhoids, in four cases; hemoptysis in one case; flooding after delivery in one case, and bleeding from spongy gums in one case. In some of these cases bleeding from the gums or bowels was associated with epistaxis, and this last symptom was observed in some of the best marked cases of the disease, with enlarged spleen.

*Dropsy* was present, more or less, in thirteen cases, generally dependent on the abdominal tumour. There was anasarca in two cases, ascites in four cases, and œdema of the lower extremities in seven cases.

*Fever.*—More or less fever was observed in eleven cases, indicated by increase of pulse, loss of appetite, thirst, and heat of skin. It was occasionally present at the commencement, at other times at the termination of the disease. In no case did it exist to any extent, or was long continued. From the frequency of splenic enlargement, it might be supposed by some that the disease was connected with intermittent fever, but that this ever occurred is very doubtful. It is said to have preceded the disease in three cases. In Case 8 the report says, that four months previous to admission there had been intermittent fever, but Dr. Walshe adds,

"this point was not sufficiently inquired into." In Case 10 there had been repeated attacks of ague, the last of which occurred nine years before he came under observation, and seven years before the abdominal tumour was perceived. In Case 19 the patient also had laboured under intermittent fever, but seventeen years previous to the commencement of the abdominal swelling. So far as the recorded cases are concerned, therefore, there is every reason to believe that intermittent fever is in no way concerned with the production of leucocythemia.

*Pallor of the surface.*—An unusual pallor of the surface was observed in many cases, resembling that of anemia. The conjunctivæ, also, were of a peculiar light blue tint.

*Jaundice.*—In one case only of all those in which the liver was affected, was jaundice observed.

*Emaciation.*—In most of the fatal cases emaciation was extreme.

*Complications.*—Disease of the lung was present in five cases, including one case of bronchitis, one of phthisis, and three of pneumonia. Bright's disease existed in two cases,—cerebral hemorrhage in one case; cancer was present in three cases,—in one, in the form of an undescribed abdominal tumour (Case 10), in a second, there was a cancer of the thyroid body and neighbouring lymphatics, and in a third, cancer of the liver, with ulcer of the stomach, stricture of the urethra, and hydrocele. All these diseases were characterised by their peculiar symptoms, or physical signs during life.

It must not be supposed that the above numerical account of the symptoms exhibits even an approximation to the proportion which any particular one holds to the number of cases on record. Owing to the imperfection with which many of these are described, important symptoms in some not being even alluded to, this is obviously impossible. Statistics are no more applicable to this subject than to any other in medicine, where the cases have not been expressly drawn up in reference to such an inquiry.

II.—*Condition of the Blood in cases of Leucocythemia.*—Of the twenty-five cases of undoubted leucocythemia, it was detected after death only, in ten; during life only, in six; and both during life and after death, in nine cases. Thus it has been detected in the living body in fifteen cases, and in the dead body in nineteen cases.

On examining the blood of living persons (which is most readily accomplished by extracting a drop from the finger by pricking it with a needle, and then examining it between glasses under the microscope in the usual way), the yellow and colourless corpuscles are at first seen rolling confusedly together, and the excess in number of the latter over the former is at once perceived. This, however, becomes more evident after a short time, when the coloured bodies are aggregated together in rolls, and leave clear spaces between them, which are more or less crowded with the colourless ones. Means are altogether wanting to enable us to determine with exactitude the relative proportion of the two kinds of corpuscles in different cases. In some the colourless corpuscles are only slightly increased beyond their usual number. In one case they are described as five times as numerous as those in health. They are also said in particular instances to be "greatly increased," "one third as numerous," and "as numerous" as the coloured corpuscles. In all these statements there is nothing exact. Perhaps the best method of judging is to regard the spaces or meshes left between the rolls or aggregations of yellow blood corpuscles. When these are completely filled up, the colourless bodies do not, in fact, amount to one-third of the coloured ones, on account of the large number of the latter which may exist in a small space, in the form of rouleaux.

The size of the colourless corpuscles in the various cases given differs considerably. Even when at first sight they appear to be of tolerably uniform size in any one case, it may be observed, when they are magnified highly and carefully measured, that some are twice the size of others, with all the intervening sizes between them. In some cases, though comparatively few in number, they are described as being three or four times larger than the coloured corpuscles, and in two cases recorded, they were in one about the same size, or somewhat smaller, and in the other of two sizes, one larger and the other decidedly smaller.

In the nineteen cases in which the blood was carefully examined after death, the

same variations with regard to number and size of the colourless corpuscles were found to exist, as have just been referred to in blood drawn fresh from the finger. It was always observable, however, that they were most numerous in the clot; and when they existed in any number, as in Cases 1 and 2, they communicated to the colourless coagulum a peculiar dull, whitish look, and rendered it more friable under pressure. When less numerous, portions of the colourless coagulum from the heart and large vessels might be seen to present a dull cream colour, easily distinguishable from the gelatinous and fibrous appearance of a healthy clot, and such altered portions always contained a large number of the colourless bodies. This was especially observable in Case 34.

There is one remarkable fact which has been strongly impressed upon me by careful observation of the preceding cases. In no one instance has the condition of the blood been observed to undergo any marked change after the excess of white cells in it was discovered. In no case has this condition of the blood been seen to appear and progress gradually, as is observed in so many other lesions. In the case of Tinlay (Case 2), the patient was under medical observation for a period of eighteen months, and the same excess of colourless corpuscles existed at the end of that time, as at its commencement. In the case of Kerr (Case 19), the corpuscles were only slightly augmented in number, and yet at the end of eleven months they were not more numerous than when first examined. Cases are still to be met with, therefore, in which the commencement and progress of leucocythemia are to be observed. Such can only be expected to be found when the miroscopical investigation of the blood is more generally practised in clinical investigation, as it is commencing to be in the Royal Infirmary.

III.—*Chemical Composition of the Blood in cases of Leucocythemia.*—The chemical analysis of white cell-blood has been undertaken in only five cases, a number far too few to arrive at any important results. One cause of this is, that the majority of the twenty-five undoubted cases were only discovered after death, when any analysis of the blood in reference to the relative proportions of all its constituents cannot be determined. Another cause is owing to the circumstance, that several of the cases observed during life were so weak and exhausted, that the abstraction of even two oz. of blood, for the purpose of analysis, could not be safely ventured upon. Of the five analyses, three were performed by Dr. William Robertson of Edinburgh, one by Dr. Parkes of London, and one by Dr. Strecker of Giessen. Dr. Robertson also analysed the blood of a sixth case (Case 28), in which there was enlargement of the spleen without leucocythemia. The following is a tabular view of these analyses, the inferences from which will be given on a future occasion:—

*Analyses of the Blood.*

| Case. | Sp. Grav. | Sp. Gr. of Serum. | Fibrin. | Serous Solids. | Globules. | Total Solids. | Water. | |
|---|---|---|---|---|---|---|---|---|
| No. 2. | 1041·5 | 1026·5 | 6·0 | 72·0 | 67·5 | 145·5 | 854·5 | Leucocythemia |
| 3. | 1036·0 | 1023·0 | 2·3 | 67·0 | 49·7 | 119·0 | 881·0 | |
| 8. | | | 7·08 | 75·22 | 101·63 | 183·93 | 816·07 | |
| Later analysis | | | 4·75 | 77·52 | 97·93 | 180·2 | 819·8 | |
| 19. | 1049·5 | 1029·0 | 5·0 | 95·0 | 80·0 | 180·0 | 820·0 | |
| 29. | | | 4·46 | 82·35 | 97·39 | 184·2 | 815·8 | |
| 28. | 1042·0 | 1025·5 | 3·9 | 75·7 | 76·3 | 155·9 | 844·1 | |

IV. *Morbid Anatomy of individuals affected with Leucocythemia.*—Of the twenty-five undoubted cases of leucocythemia which have been recorded, the body has been examined after death in nineteen. The information obtained from this source may be still further extended by a consideration of four cases in which the existence of this condition of the blood is highly probable; of seven cases recorded by Dr. Hodgkin of enlargement of the spleen and lymphatic glands, and of two cases examined after death where the spleen was hypertrophied without leucocythemia. In all, thirty-two dissections.

The organs which have been found to be most uniformly diseased are the spleen, the liver, and lymphatic glands, and of these I shall speak separately. The other lesions found in the brain, lungs, heart, kidneys, &c., alluded to in Section I., under the head of complications, were evidently accidental or consecutive, and need not be alluded to especially, in this place.

*Condition of the spleen.*—Of the nineteen cases of leucocythemia in which the body was examined after death, the spleen was found to be more or less enlarged in sixteen. In the other three, although it was healthy, the pulp in one, is said to be "a little more compact than usual;" in a second its condition after death is not alluded to, although an encephaloid tumour occupied the left side of the abdomen; and in a third the spleen was "healthy."

Of the sixteen cases in which the spleen was increased in volume, it weighed above 7 lbs. in three; above 5 lbs. in two; above 3 lbs. in two; above 2 lbs. in four; and nearly 1 lb. in one case. In four cases it was not weighed. The greatest weight of a spleen was 7 lbs. 13 oz., and the largest measurement 16½ inches long, and 9½ inches broad. The texture of the organ varied in different cases, in some being of unusual density, in others natural, and in a third case more or less soft and pulpy. In a few cases it contained yellowish masses, apparently a form of deposit, but in reality degenerated tissue. The structure was examined microscopically in seven cases, in all of which it was demonstrated that the cell and nuclear elements were increased, while the fibrous portion of the organ was apparently normal.

In four cases in which the existence of leucocythemia is probable, changes similar to those just stated occurred in the spleen, and in Dr. Hodgkin's cases similar lesions were found associated with enlarged lymphatic glands.

It is clear, however, that mere enlargement of the spleen is not necessarily connected with white cell-blood, for in case 27 it was simply hypertrophied and weighed three pounds and a half; and in numerous other cases where this organ has been undoubtedly enlarged, it has been proved by careful examination that the blood was normal—(Cases 26, 28, 35.) It remains to be ascertained what are the structural differences in the spleen existing between cases like these last, and those in which leucocythemia exists.

*Condition of the liver.*—Of the nineteen cases examined after death, the liver was diseased in thirteen. In the other six it is distinctly stated to have been healthy in five, while in one it is not noticed in the report.

Of the thirteen cases, the liver was cirrhosed in two,—one in its incipient and one in the advanced stage of that disease. In a third case there was cancer of the organ, and in the ten others the liver was more or less hypertrophied. Of these it weighed above 13 lbs. in one; above 12 lbs. in one; above 10 lbs. in one; above 6 lbs. in three; and above 5 lbs. in two cases. In two cases, though much enlarged, the weight is not stated. In these cases the organ was more or less congested, and its consistence varied from great firmness to a degree of softening amounting to diffluence. The minute structure of the liver was carefully examined in four cases, and found to be unaffected in three, while in the fourth it was infiltrated with cancerous exudation.

In the six probable cases of leucocythemia, it is said that the liver was greatly hypertrophied in four. In the other two its condition is not stated.

*Condition of the lymphatic glands.*—Of the nineteen cases examined after death, the lymphatic glands were more or less diseased in eleven. Indeed, it is very probable that they were affected in a larger number, as in most of the other cases they were in no way alluded to, and may possibly have escaped observation from an unacquaintance with the importance which, as we shall see, ought to be attached to them.

Of the eleven cases, the lymphatic glands throughout the body were greatly enlarged in four, and more or less cancerous in three others. The mesenteric glands were especially affected in two; the thyroid and epigastric glands in one; and the solitary and aggregate intestinal glands in one. In some cases they were soft, presenting on section a granular whitish appearance, and yielding a copious turbid juice on pressure. In other cases they were more indurated; and in one there were slight calcareous deposits. The glandular structure was carefully examined microscopically in eight cases, and in all exhibited increase of the normal

tissue, the juice abounding in cell or nuclear elements. In two cases, cancer cells were mingled with the healthy textures of the glands.

In the 17th vol. of the Medico-Chirurgical Transactions, Dr. Hodgkin has recorded seven cases in which the lymphatic glands were more or less enlarged, and at the same time associated with increased size of the spleen. He considers the enlargement of both structures to be allied, and to depend upon a primary lesion unconnected with inflammation or adventitious structures. The appearance of a bloody serum in the thoracic duct and absorbents struck him in two of these cases, but the blood itself was not apparently noticed. At the time Dr. Hodgkin wrote (1832) the microscope was not much employed in pathological investigation, but had the blood been examined in these cases, I cannot resist the conviction that the discovery of leucocythemia would not have been reserved for the year 1845.

In the concluding portion of this memoir, it will be my endeavour to establish from the foregoing facts, and from numerous other observations and experiments:—

1. That the coloured blood-corpuscle is derived from the colourless one.

2. That the colourless blood-corpuscles are derived from the glands of the lymphatic system.

3. That the lymphatic glandular system is composed of the spleen, supra-renal capsules, thyroid body, thymus (pituitary pineal?) and lymphatic glands, and that these constitute an extensive apparatus for the formation and elaboration of blood-corpuscles.

4. That the fibrin of the blood is derived from the solution of the blood-corpuscles, and the effete matter resulting from the disintegration of the tissues.

5. That these propositions concerning the origin, development, and disintegration of the blood-corpuscles are now as a consistent theory advanced for the first time, receive proof of their correctness from the cases of leucocythemia previously detailed, and are in harmony with the facts elicited by the labours of Hewson, Nasse, Wagner, Richert, Gulliver, Zimmerman, Wharton Jones, Simon, Kölliker, Milne Edwards, Goodsir, and others.—*Monthly Journal of Med. Science, Oct.* 1851, *p.* 328.

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## 8.—ON THE PREVENTION OF SCROFULA OR STRUMA.

By Dr. Shapter.

[In an essay upon this subject, Dr. Shapter makes the following most judicious and valuable remarks:]

There are three points to be particularly attended to in the prevention of scrofula. 1. Where a taint of the disease evidently exists in the mother, that the state of her health during the period of utero-gestation should be regarded with the most jealous care. 2. That on the birth of the child, if either parent should have strumous predisposition, prophylactic means must be resorted to during the early years of life. 3. In cases where there is no hereditary predisposition, but locality or other external agents appear the sources of the disease, these must be obviated. Females are not, for the most part, sufficiently impressed with the influence exercised by their own state of health during pregnancy on the offspring they are carrying. This applies generally; but when the system is imbued with disease, the fœtus is in a condition to receive any morbid impression much more easily. It would be useless here to lay down any series of rules. Particular stress, however, may be laid upon the necessity of sufficient clothing, exercise in the open air, avoiding heated rooms and late hours, and abstaining from an indulgence in a full, stimulating diet. On a child being born of strumous parents, every means should be taken, as regards food, air, clothing, &c., to strengthen the general health, and to counteract the hereditary tendency. Should the father only be imbued with the strumous habit, and the mother in every way a proper person to nurse her own offspring, the infant should by all means derive its nourishment from her in preference to a stranger. If, however, the mother be scrofulous, a young healthy nurse should be substituted, and for the first six or seven months the infant should be entirely nourished from the milk so afforded; in the succeeding three or four months the

addition of other light and nutritious food should be resorted to, in addition to that of the breast.

It is absolutely necessary that the wet nurse should not have given suck to her own child above a few weeks, or rather days, previous to the one she is to nurse; and during the whole period of her supplying milk, she, as well as the infant under her charge, should occupy large and airy rooms, and should take regular exercise in the open air, attending especially to the state of the digestive functions. A very common error prevails, that women, during the time they are fulfilling this function, should take in more nourishment than is their usual custom, and that it should be of a more stimulating and heating nature. About the age of ten months, or, at the latest, twelve, the infant should be weaned. Nothing conduces so much to produce a feeble frame of body as protracting the period of nursing. The milk, after twelve months, becomes poor and innutritious, causing in the child fed with it flatulence and indigestion.

The food at this period should, in great measure, consist of cow's milk, together with light nutritious matters taken from the vegetable kingdom, with some very slight addition of broth. Dr. Paris strongly recommends milk impregnated with the fatty matter of mutton suet. It is prepared by inclosing the suet in a muslin bag, and then simmering it with milk. Where it is an object to introduce much nutritive matter in a small space, he is not acquainted with a better form of aliment ('On Diet,' p. 220). Dr. Cumin, who has made trial of it, fully bears out this recommendation, and says that it has a near resemblance to goat's milk, but that it has the advantage of being more astringent. He found it to be very useful in cases of scrofulous marasmus, when almost every other article of diet caused irritation of the bowels, and passed through them undigested.

The clothing of infants is of great importance. Dr. Edwards has shown that they neither have the temperature of adult age, nor enjoy the power of generating heat to the same extent. The practical applications which result from his observations are of the highest importance. He says, with great justice, that if the attentions which children require in climates and seasons little favourable to the preservation of their existence were generally understood, and put in practice, it would considerably reduce one of the most powerful sources of mortality affecting that age in our climate. (This doctrine applies with equal, if not tenfold force, with regard to lunatics of every age.—W. S.) Cold operates much more generally than is supposed, and often affects the constitution most seriously, even when its effects are not manifested by any immediate sensations. They do not feel the cold, but they have an uneasiness or an indisposition, which arises from it; their constitution becomes deteriorated by passing through the alternations of health and disease, and they sink under the action of an unknown cause. It is the more likely to be unknown, because the injurious effects of cold do not always manifest themselves during, or immediately after, its application. The changes are at first insensible; they increase by the repetition of the impression, or by its long duration; and the constitution is altered without the effect being suspected" (Edwards, op. cit. p. 265). In those countries where, from the degree of cold, its effects are more sensible than with us, the necessity of guarding their children against its influence is fully appreciated. The result is, that in these colder climates, this agent is a less frequent cause of mortality than amongst us. At the same time that it is necessary to watch the progress of the seasons, and to guard against the injurious effects of their climate, it is also of consequence to promote that state of the system which is favourable to the generation of animal heat, in order to compensate for the abstraction of it by radiation, the temperature of our climate always making this a condition of our existence. This is effected by maintaining the organs of respiration and circulation in a state of vigour. The chief means which we have of promoting this, are exercise in the open air, living in apartments where ventilation is good, and the maintaining a healthy condition of the surface of the body: immersion in cold water is useful to this end.

The importance of fresh air cannot be too strongly inculcated. The rooms occupied by those of a strumous tendency should be large, airy, well-ventilated, and not over-inhabited; of all things the child should not be confined in a cot or bed surrounded by curtains. The child of a country labourer, with everything against him, except that he enjoys fresh air, exhibits a vigour of health and appearance that

is in vain looked for in those nurtured in the confined atmospheres of the nursery. Fresh air gives tone to the skin, vigour to the respiration, and conduces in great measure to a healthy state of the digestive organs.—*Med. Gazette, June* 13, 1851, *p.* 1021.

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9.—*On the Treatment of Scrofula as it affects the External Lymphatic Glands.* —By T. Balman, Esq.—The best application for almost every kind of Scrofulous sore is certainly the iodide of lead ointment: the ung. hyd. nit. oxid. is more stimulating for some very indolent and flabby sores; but the former has generally succeeded with me so well that I now seldom use any other.

The disposition to scab seems very remarkable in all these kind of sores; and however beneficial this process may be in other wounds, it very nearly always tends to impede, rather than otherwise, the healing of scrofulous ulcers, not only by preventing granulations from forming, but, by allowing the ill-conditioned materials to accumulate and fester under it, causes further destruction to the subjacent tissues. I have generally, therefore, directed a poultice to be applied until the sore becomes clean, and then endeavour to prevent their reproduction by some of the stimulating applications already alluded to. I have used a cataplasm composed of bran, linseed, and common yellow soap, with very good effect in these cases.

Seeing the tedious and protracted nature of these sores, and the deformity that almost always attends the healing of the wound under the most favourable circumstances, points out to us the desirability of endeavouring to prevent an abscess from forming, and to use all the means within our reach, both general and local, calculated to disperse the swelling prior to its arriving at that stage when the elimination of the morbid products by suppuration becomes inevitable. This leads me briefly to notice some of the means by which this object may sometimes be accomplished.

We have observed, in the first part of this communication, that these glandular swellings are met with under a great variety of circumstances. The patient may, for example, present the fine, delicate, white skin, the tumid lip, and crimson hue of cheek, and the languid, listless, and enfeebled gait so familiar to us in persons possessing the well-marked lymphatic temperament; or all these signs of the strumous constitution may be for the most part wanting, and we have the outward characters of a sound and vigorous constitution; or there may be evidences of a previously acquired syphilitic taint sufficient to justify our pronouncing this to have been the primary *exciting* cause of the disease. A disease, therefore, occurring under so many and varied aspects must of necessity require different modes of treatment. If, for instance, the swellings appeared for the first time after an attack of primary syphilis, the iodide of potassium and sarsaparilla will be found the best remedy, all other remedies, as far as my experience goes, being perfectly useless.

I have made trial of most of the reputed antiscrofulous remedies, and must confess with very different results. The following, however, deserve some notice:—mercury, barium, iodine, alkalies, cod-liver oil, &c.

*Mercury.*—Of the different preparations of this metal I have commonly preferred the hyd. c. cretâ and the bichloride. The former may be given, in combination with rhubarb and magnesia, as an alterative aperient, every other night, or oftener, according to circumstances. The benefit accruing from some simple combination of this kind by improving the secretions, and giving tone to the digestive mucous surfaces, is often very striking; and, indeed, it is not uncommon to see some of the milder descriptions of cases get well by a short continuance of these medicines alone. It should, I think, precede every other kind of treatment. The bichloride I have given in doses of 1-16th to 1-20th of a grain dissolved in distilled water, or in the form of a pill, with the ext. of sarsa, twice or thrice a day. I have seen it of use in glandular swellings complicated with some of the more obstinate forms of scaly cutaneous disease, and particularly psoriasis. Under these circumstances, and provided the general health be good, this preparation may be given with advantage. It sometimes rapidly causes the absorption of the intervening cellular tissue, by which several isolated tumours are often aggregated into one firm resisting mass; and here its beneficial operation seems to stop, the glands themselves being seldom completely dispersed by this remedy, however long continued.

In irritable subjects it rapidly brings on suppurative inflammation, and this may be said to bring the case to a close earlier than otherwise might have happened.

*Barium.*—I have made trial of this remedy, so much extolled by some of the old writers, and am disposed to entertain a very favourable opinion of its efficacy, particularly in chlorotic, cachectic, and other cases attended with a languid circulation and much general debility; it seems, therefore, well adapted for females of a lymphatic temperament and attended with any irregularity of the menstrual function. I generally use it in combination with the muriated tincture of iron. ℞. Baryta chlorid. gr. x.; tinct. ferri mur. 3 ij. to ʒ ss.; syr. aurantii vel aq. destillat. ʒ x.—Mix; of this half an ounce to an ounce may be given two or three times a-day.

*Cod-liver oil* has appeared to me to exercise little or no influence upon the great majority of external glandular tumours. It must, however, be admitted that it is a potent and most valuable remedy in some forms and complications of the disease; when associated with caries or the bones of phthisis, for instance, I almost invariably order the oil, as exercising a most beneficial influence in both these cases. Again, in many of those boggy and unhealthy sores which are observed to remain unchanged for a very long time, and are usually covered with a thin dry crust, which, on being removed, exposes a pale, soft, flabby ulcer, exuding a thin, grumous, unhealthy looking matter; I have often observed these kinds of sores get well by a lengthened continuance of the cod-liver oil, having previously resisted most other remedies. Whatever may be the rationale of its operation, there can be no doubt but that it supplies to the blood, and thence to the different tissues of the body, very important nutritive materials which were previously wanting. Where, for instance, we see a sore exuding a thin colourless fluid as transparent as water, alkaline, and coagulating on the application of an acid, consisting of little else than the serous and watery portions of the blood, which we have seen to be so abundant in this fluid, incapable, therefore, of cell growth and the production of new tissues, from a deficiency or imperfect assimilization of that higher organised material, the fibrine: if, under these circumstances, cod-liver oil, or any other agent, causes the sore to throw up healthy granulations and get well, it must be by supplying the blood with a more highly vitalized pabulum, which, by increasing the red corpuscles, substitutes for the serous and watery blood-liquor a plasma more in accordance with what we know to be the healthy and standard condition of this fluid.

*Alkalies* have for a long time been reputed as valuable anti-strumous remedies, and have been recommended very recently by some very high authorities. This has doubtless arisen in some measure from some partiality for, or the belief in, the antiquated doctrine which assumes that there is some specific acid principle pervading the animal fluids which determines the development of the disease. It is hardly necessary to state that this is a mere hypothesis; and I have, by some attention to this point, satisfied myself that there are no grounds whatever for believing that an excess of acid of any kind is generated either in the chylopoietic viscera or eliminated from the system with the different excretory products. It is quite true that the irregular appetite, bad digestion, and vitiated alvine discharges, do frequently in childhood precede the early manifestations of scrofula, and seemed to point out the probability of there being an excess of acid generated in the primæ viæ; but it by no means follows that this should be one of the most important features of the disease. Not only on these grounds, but from practical experience, I have come to the conclusion that little benefit will result from any lengthened persistence in this class of remedies; on the contrary, I am disposed to believe that they are sometimes absolutely injurious, by deteriorating still more the already too impoverished blood. In proof of this I may mention that, during the trial I made with the various alkaline preparations reputed to cure scrofula, I observed in many instances one of the commonest complications of this disease to appear: I allude to ophthalmia, which as speedily yielded to the opposite treatment.

*Iodine*, either alone or in combination with potass, has succeeded but indifferently in my hands; and I believe it will be found that the value of this substance has been much over estimated. The iodide of iron, however, is a very excellent preparation, and may be given either alone or in combination with cod-liver oil.

*Phosphoric acid.*—In one of my former communications I casually alluded to

phosphoric acid as a medicine which I had seen to exercise a very beneficial effect in a considerable number of cases. Since this period I have steadily watched its operation upon a more extended scale, and I do not hesitate to assert that, as a therapeutic agent, it will be found in no degree inferior to any before mentioned. Its effects are sometimes very marked in some of those obstinate forms of strumous conjunctivitis which we know will sometimes resist for a long time every kind of treatment, and at other times will quickly disappear under the influence of some simple local application, but perhaps as speedily return under the slightest exciting cause. In these (if one may so express it) intermittent forms of ophthalmia arising in a scrofulous constitution, I have found this medicine of especial service, not only in completely removing the disease, but also in preventing its recurrence. I am in the habit of giving it in the infusion of columbo, commencing with five minims of the dilute acid of the Pharmacopœia, gradually increasing it to twenty or more. This combination seems to agree very well with the stomach, and, unlike most other mineral acids, may be continued for any length of time without producing any unpleasant effects. Whether its beneficial effects are confined to its tonic influence, or exercise some more specific influence upon the blood and system generally, I do not know.

As regards the treatment of scrofulous swellings, I believe that much harm is sometimes done by the indiscriminate use of frictions with the iodine ointment and other compounds, by inducing a low form of inflammatory action in the skin and integuments, and the chance of bringing on suppuration which it is desirable in many cases, for reasons before stated, to prevent. On this account, and also from the fact that the action of all such applications is very feeble in dispersing the tumour under any circumstances, I seldom now have recourse to them.

In the absence of all signs of inflammatory action after a trial of some of the foregoing internal medicines, I prefer, as a counter-irritant, pencilling the part with the solid nitrate of silver a few times, at intervals of a week or ten days. This, I think, is a milder and safer proceeding than the use of blisters, the action of which is more diffusive and irritating.

It is hardly necessary to insist upon the utmost attention being paid to a variety of circumstances regarding the general management of scrofula; such as good and wholesome food, good air, sea-bathing, exercise, and various other hygienic means, which are known to exercise the happiest effects in every form and variety of this disease; and, if trusted to alone, would, I am persuaded, in many instances, give the patient as good, if not better, chance of getting rid of this most intractable disease.—*Med. Gazette, Aug.* 22, 1851, *p.* 323.

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10.—*On the Treatment of Small-Pox.*—By Joseph Grosvenor Pasquin, Esq., Birmingham.—[After mature deliberation upon the treatment of small-pox, Mr. Pasquin arrived at the conclusion that the pitting and disfigurement of the face was dependent upon the confinement of the matter too long in the pocks, causing a slough thereby to form in the cellular tissue lying between the cuticle and the fascia of the face. This is not regenerated, hence the cuticle falls into the space where the cellular tissue is then wanting, and thus follows the pitting. To obviate this, Mr. Pasquin determined to puncture each pock previous to its arriving at perfection, and apply a common poultice. He adds:]

I have had seven cases, four wherein the larynx was not at all affected, on which I tried the experiment of puncturing every pock on the face, and afterwards applying repeated poultices. This treatment succeeded to my utmost satisfaction, the face being left as clear of marks as it was previously to the attack of small-pox. I had three more with affection of the larynx, the respiration being so difficult that I expected asphyxia would come on in a few hours. To these I applied leeches over the region of the larynx, and on the following morning, I found the respiration had become perfectly free and easy.

One of the three cases last reported is that of D——, labourer. This was the worst case of confluent small-pox I ever witnessed in the whole course of my medical career. He was, in the early stage of the disease, attacked with great difficulty in breathing; his tongue, soft palate, pharynx, and larynx, as far as I

could see, being covered with pocks. I applied leeches at night, and on the following morning his breathing was perfectly free and easy. His face was so completely covered with pocks, that I could not find one space over his whole face, sufficient to lay on a grain of sand, which was uncovered by any pock. In this case I punctured as many pocks as I could myself, and requested his mother and sister to puncture the remainder. He is now up, and doing well, and he has not a mark on his face.—*Lancet, July* 12, 1851, *p.* 30.

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## 11.—ON CANCER-CELL.

(From a Review of Dr. Lebert's Treatise on Cancerous Diseases.)

[In reviewing M. Lebert's work, the Reviewer asks, What has the microscope really accomplished? Have we been enabled by it to detect the nature and structure of cancerous growths with greater certainty than we could before? To this an affirmative may be given, although a discrepancy exists as to the element or elements by which this is done. It, perhaps, may be said to be more apparent than real.]

In his 'Physiological Pathology,' M. Lebert thus expresses himself:—"The cancerous globule has decided characters which distinguish it from every other kind of morbid production." This proposition is repeated in the same volume, in the following words:—"The cancerous globule is the part which distinguishes cancerous tumours from all other morbid productions." Now if the cancer-cell really had characters so distinctive, nothing of course could be easier than to determine the nature of cancer. But it is denied by other pathologists that such is really the case; and it is especially pointed out by Dr. Bennet (on 'Cancerous and Cancroid Growths'), that isolated epithelial cartilage, and fibro-plastic cells may, under certain circumstances, so closely resemble cancerous ones as not to be distinguished from them. Now if this latter proposition be true, the value of M. Lebert's statement at once vanishes when it is most required. On the other hand, it has been contended that groups of cancer-cells can, in the majority of cases, enable us to form a correct conclusion, especially when attention is paid (as should invariably be done) to their relation to the accompanying elements of the growth. These and similar observations seem to have made an impression upon M. Lebert; for without acknowledging a change of opinion, he now expresses himself as follows:—"An isolated cell being given, can we always recognise, by microscopic examination, if it belong to a cancer or no? We do not hesitate to answer *in the negative.* But the question we have always endeavoured to resolve is this,—a morbid tissue being given, can we recognise, by means of a microscopic inspection, if it be cancerous or not? On this point we do not hesitate to answer in the affirmative."

It follows, therefore, that M. Lebert has greatly modified his views on this essential point. He no longer attaches the same importance to the cancer-cell as a means of diagnosis; but considers this element, in conjunction with those others which make up the morbid tissue, to constitute the only foundation for a sound anatomical ground of diagnosis. Whilst, then, M. Lebert is now brought to agree in the accuracy of Dr. Bennett's opinion, he accuses the latter pathologist of holding a view which he never dreamt of, and enters into a laboured argument to show that he, as well as Vogel and Virchow, deny the specificity of the cancer-cell. In other words, he has confounded together two very different questions,—viz., the diagnostic character of a cancer-cell; and the theoretical opinion as to whether one cell can be transformed into another. But even here he has mistaken Dr. Bennett's language, who distinctly says, after arguing this question, "It may therefore be doubted whether the true cancer-cell *be ever* formed by transformation of a previously existing one."

It results, however, from this criticism, that notwithstanding the confusion pathologists are led into from differences in modes of expression, and from incorrectly appreciating the idioms of a language with which they are not very familiar, that the discrepancies existing in various works published in England, France, and Germany, are, as we have previously seen, more apparent than real: more verbal

than essential. Indeed, there can be no doubt that the results of microscopic observation are now tolerably uniform amongst accurate histologists in all countries; and that the microscope is daily becoming more necessary, not merely as an instrument of scientific research, but as a means of diagnosis.

Another point of importance in the present state of our knowledge is, what we should understand by the term "cancroid." This term has been extended to all growths which are capable of being mistaken for cancer. In such a sense it is evidently provisional, inasmuch as no sooner do our means of distinguishing these become more certain, than they cease to resemble cancer. This applies to fibrous, sarcomatous, tubercular, and other growths, which are still too frequently confounded with cancer by surgeons. On the other hand, we conceive it to have been distinctly proved that there is a class of growths essentially differing from cancer in structure, and yet which has a tendency to return, to attack the lymphatic glands secondarily, to soften, ulcerate, and kill; in short, to present all the characters usually grouped together under the term "malignant." To this class belong certain epithelial, cartilaginous, and fibro-nucleated growths, and probably other forms which have not yet been described.—*Monthly Journal of Med. Science, July, 1851, p. 51.*

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## 12.—CASE OF ACUTE GLANDERS—RECOVERY.

By Dr. W. F. Mackenzie, Fellow of University College, &c.

[It is generally admitted that glanders may be communicated from the horse to man. The following case is an example in proof. William Wilcox, a horse-keeper, aged 58, was admitted into the Paddington Infirmary on the evening of the 19th of July. His face generally was swollen and suffused; especially in the submaxillary region. A large quantity of saliva was pouring from his mouth, his breath was extremely fœtid and sickening, his gums were swollen, his teeth were loose, and his nostrils were filled with a thick glutinous secretion, which was with difficulty removed. From destitution he had been accustomed to sleep in stables, or wherever he could get a shelter, and from this circumstance he had undertaken the charge of some glandered horses at Islington. He got progressively worse, the swelling increasing under the jaw to an enormous tumour. He broke out into profuse cold sweats, but he had no rheumatic pains, nor any local affection of the face, nose, or salivary glands. Now this seems to be a case of acute glanders, and yet if so it differs from other reported cases, as neither ecchymoses, gangrene, nor pustules were observable on the mucous membrane, neither was there any specific affection of the lymphatics or cellular tissue. The enfeebled state of his constitutional powers from previous destitution, seems to have been the chief predisposing cause. Next as to the]

*Treatment.*—In offering some remarks upon the treatment of the present case, I cannot introduce the subject better than by quoting the following passage from Dr. R. Williams's philosophical work "On Morbid Poisons." "All the remedies hitherto tried in acute glanders have failed, for only one out of fifteen has recovered, and that not from any particular treatment. Blood when taken at the commencement, has been found buffed, and some momentary relief has been afforded, but the bleeding ought not to be repeated, as in the more advanced stages the prostration is great, and stupor quickly follows, and leech-bites have become gangrenous. The coming on of typhoid symptoms has caused quina, valerian, serpentaria, ammonia, and other stimulating medicines to be exhibited, but all these experiments have failed; vomiting and purging have been likewise had recourse to, but these measures have been equally unsuccessful. In the present state of our knowledge of this disease, every experiment in treatment is warranted as the only chance of subduing a malady which has so constantly proved fatal. In the more chronic forms of the disease, the recovery of the patient has appeared rather to be owing to the excellence of his constitution, than to any powerful effect produced either by general or local treatment."

In the present instance, I had no reasonable expectation of the patient recovering, nor had he, or any one who was present at the time when I first saw him; and yet in twenty-four hours he was comparatively out of danger. Now this change

cannot be ascribed to any improvement in his sanitary condition consequent upon coming into the hospital. For, in spite of wine and other assistance, he was worse then than when he was admitted. Hence I think that the improvement which took place must be mainly attributable to the treatment which may be thus recapitulated in the order of sequence. 1st. An incision in each of the Whartonian ducts. 2ndly. An emetic of ipecacuanha. 3rdly. Sesquicarbonate of ammonia in water hourly, as concentrated as it could be swallowed. 4thly. An opiate at bed time, with wine and nourishment, in such quantities as the patient could be prevailed upon to take.

The incision was made in the Whartonian ducts on account of their being much distended, and from an impression that their orifices were closed from the swollen state of their parietes. It gave immediate relief to the patient, by allowing a free escape of a large quantity of pent-up saliva, and the swelling and tension of the parts were at once lessened by it. The emetic was considered to be indicated by the existence of gastric derangement throughout the progress of the case, which was manifested by a constant disposition to sickness, and the inability of the patient to retain anything upon his stomach. It was also given for the purpose of producing reaction, and rousing the constitutional powers by its operation upon the ganglionic nervous centres.

But the principal reliance was placed upon the frequent administration of the sesquicarbonate of ammonia *in a concentrated form*. This remedy, and this mode of exhibiting it, were suggested by the good effects which I had seen it produce when so given in the severe affections of the throat, which are met with in malignant scarlet fever. It was originally recommended by Dr. Peart in such cases, in a work on the malignant scarlet fever and sore throat, which he published in 1802; and its efficacy is corroborated by Mr. Wilkinson, who quotes also the testimony of Mr. Ricardo in its favour. As, however, the works in question are not very accessible to the profession, and as in the particular case under consideration, it appeared to have been most beneficial, and to have been the main cause of the patient's recovery, I shall add a few remarks upon the remedy as thus exhibited.

Ammonia is reported to have been given in glanders, but without success; and the same remark has been made with reference to its exhibition in scarlet fever; but it is not so much to the medicine, as to the method of giving it, that we are, I apprehend, to look for the beneficial results. On this point Mr. Wilkinson remarks:—"It has been observed that Dr. Peart has no claim to originality in the employment of the subcarbonate of ammonia in the cure of scarlatina, Dr. Withering having used the same remedy many years before: but there may not be almost as much originality in the *manner* of exhibiting a remedy, as in the first adoption of it? Dr. Withering says, that the volatile alkali may likewise be given with advantage, but it is difficult to get a sufficient quantity of it swallowed (p. 84); and he prescribes it in the following form. ℞. Sal. absinth. 3 ij.; sal. vol. ammon. 3 ss; aq. fontan. ℥ ij. M. Ft. solution, to be put in a quart of white wine whey, and the whole to be taken in twenty-four hours; by which it appears to me that he knew little of the powers of subcarbonate of ammonia in this disease. His manner of exhibiting it would destroy its effects, or at least the effects upon which I should depend for its advantages in scarlatina." These remarks appear to me to be equally applicable to the treatment of glanders with ammonia, as it is ordinarily given.

On the other hand, it was an essential part of Dr. Peart's treatment of the scarlatina, anginosa and maligna, that it must be given in a state as strongly stimulating as it can be swallowed. His mode of exhibiting it is contained in the following passage, which is quoted from Dr. Willan. "He dissolves two drachms of the carbonate of ammonia in five ounces of water, and directs the patient to take two teaspoonfuls every two, three, or four hours, according to the urgency of the symptoms. If the difficulty of swallowing abate, and the patient wish for it, a little cold water may be added to each dose. Cold water or toast and water may be drank at pleasure. The above remedy was given in every form and in every stage of the scarlatina. "Some," he says, "were glowing with universal efflorescence; in some the extremities were swelled; in others fetid ulcers appeared; in most the throat was swelled and inflamed, often ulcerated, and

respiration almost prevented; but, in the most alarming cases, a scorching fever and raging delirium rendered the patient's situation horribly distressing. Yet, in all these variations of the disease, the volatile alkali was my specific, which I administered to between two and three hundred patients *successively and successfully*." The immediate effects of the remedy are stated to be a diminution of heat, fever, and delirium, and a disposition to sleep. Mr. Wilkinson confirms the accuracy of these remarks; and, in regard to the *modus operandi* of the medicine, says, "I will take the liberty to state, that I depend not upon its diuretic nor its diaphoretic qualities, but believe that it possesses the power of increasing the strength of the arterial action, at the same time that it diminishes its frequency; that it supports the vis vitæ, without increasing the heat or irritability of the system, and by such means counteracts the tendency in the scarlatina, anginosa and maligna, to ulceration and sloughing, and all the other evils which sometimes attend this dreadful disease.

Mr. Wilkinson further gives the following practical illustration of the success which attended the treatment of scarlet fever in this way. "In the year 1803," he says, "I attended several cases of the scarlatina maligna with Dr. Willan and the late Dr. Hamilton. It is well known that the disease raged most fatally during that period; and we lost four of our patients out of five in one family. Never were men more puzzled to know what remedies to adopt. All which Dr. Willan has recommended in his publication were employed. Emetics, purgatives, calomel, and antimony, many other diaphoretics, opium, wine and acids, bark, blisters, decoct. contrajervæ, with oxymel of squill, application of cold water, gargles of different descriptions, fumigations, &c., all without the least good effect, all without making the least sensible impression upon the disease in any of its stages. About this time, Dr. Peart published his 'Practical Information on the Malignant Scarlet Fever and Sore Throat,' in which he describes the wonderful effects of the subcarbonate of ammonia, and considers it to be endowed with a specific power over that disease. Like other practitioners, he was continually lamenting the loss of his patients by that dreadful malady, till, by his own suggestion, he employed the subcarbonate of ammonia in the manner he describes; and from that moment he did not lose one patient, out of nearly three hundred. When I read this account, I immediately inquired after the character of Dr. Peart, and finding that he was most respectable both in talent and probity, and engaged in very considerable practice, I had no reason to doubt the truth of his statement, and therefore immediately adopted his remedy; and consonant with my own principle, that an effectual remedy for one genus, will, with proper management, cure all the genera of the same order, I administered it in all the following diseases—erysipelas, rubeola, scarlatina, urticaria, roseola, and erythema, with all their varieties; and I am happy to be able to declare, that from that moment to the present, a space of seventeen years, I have not only never lost a patient in the above diseases, but have never had a case of the kind that has even appeared dangerous, or that has given me a moment's anxiety."

In addition to his own, he adduces the following testimony to the remedial powers of ammonia, when so given, from Mr. Ricardo, of Bow, a gentleman of great ability, and very extensive practice: "I have received your letter, requesting me to state the result of my experience of the effects of subcarbonate of ammonia in the treatment of measles, scarlatina, and erysipelas. As I employed this medicine at your suggestion, many years ago, I lament that I have not placed on record any *particular* cases, many such having been under my care; but perhaps it may be sufficient for your purpose, that I am able to declare that the exhibition of subcarbonate of ammonia in such cases has been attended, under my direction, with constant success. You know that I am situated in the neighbourhood of many schools, which I have the pleasure of attending; and during twelve or fourteen years, in which I have employed the subcarbonate of ammonia, I have not lost a single patient, of some hundreds whom I have attended in the above diseases."

I have quoted these passages at some length, not only because the plan of treatment they refer to was adopted in the case of glanders which I have reported, with very striking results, but because I believe that the principle comprehended in it is *applic*able to many other analogous diseases, in which it has hitherto not been

tried; and further, because I am anxious to do justice to those with whom the merit of originating it rests.—*Lond. Journal of Medicine, Sept.* 1851, *p.* 788.

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## 13.—ON CHRONIC RHEUMATISM.

By John Cargill.

[The following paper, read before the Newcastle and Gateshead Pathological Society, comprises an analysis of one hundred and forty-three cases, one hundred of which were treated by the nitrate of potash in large doses, and the remaining forty-three by colchicum.]

These cases have been treated during a period of nearly six years, *i. e.* between 1842 and 1848, and they have been nearly all in-patients of this Hospital, so that I have had them constantly under my own eye, the few not so situated having been out-patients.

I have compared the cases together under as equal circumstances as possible, and have endeavoured to attain as much accuracy as I could by carefully registering them at the time; this register comprises the following features:—Age, sex, duration of malady previous to admission, seat of pains, dose and combination of remedy, time of its employment, result, disturbing or other effects on the system, temperament of the patient, and concomitant treatment.

I shall first consider these points in reference to what was observed in the colchicum patients, and then in those treated by nitrate of potash, and shall conclude by recording certain deductions, which I think have unfolded themselves from the various facts, and likewise mention the views I entertain of the pathology and intimate nature of rheumatism.

Of the forty-three cases treated by colchicum, fourteen only were cured, or about one-third, and the average duration of the treatment was fifteen and a half days; the average duration of the malady before admission being seventy-three days. In addition to the fourteen who recovered entirely, there were twelve relieved, whilst twelve remained no better. In one the complaint appeared to be worse, and in the other four, circumstances arose which prevented any positive conclusions from being arrived at.

*Dose and combination of the Colchicum.*—In rather more than half of those cured, that result was effected by the vinum seminum colchici in the dose of from fifteen to thirty drops thrice a day, with a little magnesia and sp. etheris nitrici. In a very few instances ten grains of Dover's powder were given a few times at bed-time. In six out of the forty-three, the colchicum was given in powder in four grain doses thrice a day; in one case it was given in six grain doses thrice a day, and in one case in two grain doses thrice a day, all combined with pulvis cretæ. In all but the last named it produced vomiting, griping, and diarrhœa in two or three days' time, and had to be left off for the vinum with magnesia. Of this latter combination, the dose before mentioned, viz., ℥ xv. to xxx. with fifteen grains of magnesia, and 3 ss. of sp. eth. nit. was the most effectual, and the best borne. When the vinum was given by itself it seemed slower in its curative effect, and when given in 3 jss. doses or 3 j. doses thrice a day, either alone or combined (a measure in a few instances adopted), it invariably had to be left off, from its producing very speedily its usual severe physiological effects, with great depression, and often cramps, the disease remaining at the same time unaffected. I should add, that these results followed even when the above doses were attained to very gradually.

*Concomitant treatment.*—In seventeen out of the forty-three cases the warm bath thrice a week was used, and in fourteen out of this number manifest relief was obtained. In ten cases out of the forty-three, Dover's powder was given in from ten to fifteen grains each night, and in six of these cases it was followed by beneficial effects. Cupping was occasionally used, and generally with benefit. Bleeding from the arm was scarcely ever practised, and calomel, Epsom salts, blue pill, or colocynth, were used as preliminaries, if constipation existed. As to the seat of the disease, it was in the several joints and muscles. In four cases wherein

the rheumatism existed along with sciatica as its chief feature, the treatment by colchicum was fruitless.

II. *Chronic Rheumatism treated by Nitrate of Potash in large doses.*—Of the one hundred cases treated by this method, there were sixty-one cured, being more than six-tenths of the whole, and the average duration of the treatment was thirteen and three-quarter days. In addition to the sixty-one cured, there were twenty who experienced great relief, but were not entirely cured at the time of dismissal; there were five who experienced very slight benefit only, three received no benefit, and three got worse. In the remaining eight cases no positive conclusions could be arrived at.

*Dose and combination of the remedy.*—The usual dose to begin with was ℈ ij. thrice a day in barley water; this was adhered to in many cases throughout, but in a large number it was increased to 3j., 3iss., 3ij., thrice a day, and in one case 3iij. every four hours was begun with and continued without intermission for twelve days, without the smallest inconvenience to the patient, who was cured in that period. This was a bad case of two and a half years' previous duration. The dose was often begun with and continued at 3j., and with no disagreeable effect; sometimes 3j. thrice daily, and sometimes 3j. every four hours consecutively.

Being desirous of ascertaining whether the duration of the malady might be shortened, or good in other ways obtained by combining the nitre with sp. nit., antim., tart. and tinct. opii, I adopted this in a considerable number of cases, and the result has shown me that no advantage is derivable from this practice. The dose of sp. of nitre was generally from ♏ xv. to 3ss. or more; that of the vin. antim. ♏ xv., and that of the tinct. opii. ♏ v. to each dose of the pot. nit. Sweating and diuresis were equally produced by the nitre alone as when given in the above combination. Of the three, the tr. opii alone appeared useful by frequently assuaging the severe pain.

*Disturbing effects.*—It is of great importance to remark that this remedy was invariably administered in a large quantity of warm barley water—not less than ℥ viij. to each dose. When given in the above large dose, without a diluent and demulcent like barley-water, it produces intense griping, with pallor of the countenance and cold perspiration, the pulse and heart's action flagging and coming down, and the greatest anxiety being experienced. This is followed by a dry red tongue, with enlarged papillæ and much thirst. This I had an opportunity of seeing to an intense degree in one case wherein the nitrate of potash in those doses had been administered several times without any diluent by the oversight of a nurse; she gave it in ℥ iss. of plain water. I was on the point of applying numerous leeches to the epigastrium, fearing that gastritis was coming on, when the symptoms at last yielded to diluents and warm external applications, leaving no appreciable effects behind.

I shall now mention what were the *disturbing effects on the system* observed to be produced by large doses of nitrate of potash in cases *where it had been duly taken* with barley-water, but had not been well borne by the system. Those effects were seldom manifested, the medicine, when properly diluted, seeming to act mildly and efficiently. When it is not tolerated, however, its effects are primarily on the nervous system. They are these: general debility of the limbs, especially the lower extremities, and the knees, too, particularly complained of. I have seen this carried to an extent which made the patients believe that they were seized with general paralysis; the whole body seemed to be made of wood, and for some hours it was impossible for them to rise from their seat or to move hand or foot. To this were conjoined general tremblings, and the speech was affected; occasionally the names of things were forgotten or mistaken; there was also giddiness, and a painful rushing sound in the ears. I never in these rare instances saw any distortion of the features, and the symptoms subsided in a few hours by diuretics or copious perspiration. In the event of such results occurring, the chief remedies I should recommend would be hot diluents and hot blankets. The subjects of them will be found generally of the purely *nervous temperament*, especially if associated with feeble power of the constitution. When the sanguine or bilious temperament is combined with the nervous, the remedy is better borne and may be pushed farther; and it agrees with my observation that the bilious lym-

phatic temperament, with its firm, harsh, muscular development, is the one in which this plan of treatment the oftenest succeeds, and may be used the most fearlessly, as it is the one on which chronic rheumatism, when once established, displays itself with perhaps the greatest relentlessness.

The *concomitant treatment* was simple, and most generally dispensed with altogether (with a view to ascertain more accurately the value of the nitrate of potash itself), except in cases of severe complication, in which the need for additional means, chiefly local, was urgent. It consisted in occasional warm baths and vapour baths. Cupping and leeching were had recourse to in such cases as showed a concentration of the disease in particular joints, as evidenced by swelling, redness, and acute pain not shifting its seat. In dull chronic pains localised, occasional blisters were applied, and often with benefit; and, towards the termination of the cases, a liniment of ammonia and turpentine was frequently useful in restoring the natural suppleness of the parts. When the pains were so great as to prevent sleep, and to harass the patient in an unusual manner, a draught of muriate of morphia, with solution of acetate of ammonia and water, was given at bed-time. The bowels were kept free by means of occasional light catharties; and the treatment was generally commenced by giving a dose of calomel and colocynth, followed by a draught of infusion of senna with sulphate of magnesia.

The *diet* enjoined was nutritious, being the ordinary diet of the house—viz., meat once a day, milk, rice, broth. In such cases as presented symptoms verging on the acute, low diet was prescribed—such as milk, tea, sago, &c. In all old-standing chronic cases generous diet was found the best, accompanied even by ale, porter, wine, or gin.

In the above 100 cases the *duration of the malady previous to admission* was widely different,—so much so, that no analytic average could be struck with a view to results that would not have a tendency rather to conduce to error than to elucidate truth. I may state in general terms that the length of time in these cases previous to coming under the above treatment was from seven days to ten years, whilst there were a few who could remember no period of their lives in which they had not been victims, more or less, to the complaint. Two months, five years, six years, six months, one year, were the most common periods cited; and it should be remarked that nearly all the cases were of an unusually severe character, and had been under all manner of practitioners; for many, despairing of a cure otherwise, had committed themselves to the tender mercies of unprincipled quacks, from whose fiery ordeal they had emerged with the conviction that now nothing but a residence in an infirmary with the reputation of our own could avail to benefit them!

*Sex.*—It is remarkable that, of the whole 143 patients, 17 only were women, the remaining 126 being men. The average age of the women was 35¼, that of the men 37¼. From this it appears that, in this part of the country, men are about 8½ times more liable to be affected with chronic rheumatism than women, or for one woman attacked with chronic rheumatism there will be between eight and nine men. This is in all probability owing to the greater exposure of men to cold and wet; for I have found that in all of these cases the exciting cause, when any could be given, was invariably cold and wet, or sudden transitions from a high temperature to the opposite. On referring to MS. notes of M. Louis' clinical lectures on this subject, taken down by me at the time of their delivery at the hospital of La Pitié, in 1835, I find his experiments the same as to the exciting cause—invariably exposure to cold air or draughts (un vent frais).

The difference as to the *frequency of rheumatism* in France and England seems to be very great. Louis says that, out of 100 cases of all sorts treated by him, he only found one of rheumatism; and in the Paris hospitals, during two years, it was rare that rheumatism, whether acute or chronic, ever fell under my observation. That the difference is great among us will appear from the following fact:—On analysing, a good while ago, a number of cases of all sorts, nearly all of them chronic, treated by me in this hospital, embracing a period of five years, and amounting to 959, I found that 86 were cases of chronic rheumatism, being, on an average, one in eleven and a sixth of the whole number. From this I think we may infer that climate exercises an immense difference in this disease; and doubtless the same cause is, in regard to all other diseases, more powerful than we are

generally aware of. How else can we explain the entire exemption of some countries from certain maladies? In India and Egypt phthisis is unknown.

I will take the opportunity of stating here, that I believe heart affections to be very uncommon associates with chronic rheumatism; nor do I think that this malady is apt to be *followed* by cardiac disease. In the cases above analysed it was constantly found that such of them as showed heart disease, had been preceded by rheumatic fever, and the heart affection could be traced to that period of acute disease. This is in conformity with the opinion, now, I believe, generally entertained—viz., that acute rheumatism is frequently accompanied by endocarditis, and, without very rigorous measures, is apt to be succeeded by permanent disorganisation of the heart. I have seen this hold to the full extent admitted by Dr. Hope, though not perhaps to the degree maintained by Bouillaud. In chronic rheumatism properly so called, heart disease is, in my opinion, a rare occurrence.

In speaking of acute rheumatism I would record here my experience that in patients *under the age of puberty* acute rheumatism seldom or never happens without most seriously involving the heart; and the younger the patient (I have known it occur at five years) the more certainly fatal is this heart affection. I have never seen a single subject in the above category who eventually shook off the heart affection and recovered. And, in addition to the ventricular hypertrophy and dilatation constantly present in these cases, as well as the valvular disease, I must mention a morbid appearance perhaps equally constant, and which I think has been overlooked by pathologists, or only casually if at all mentioned—viz., a tough, dense, false membrane lining the general interior of one or other of the dilated auricles, generally the left, obliterating the musculi pectinati almost entirely, and so converting the auricle into an uncontractile sac: thus furthering mitral regurgitation, and, by its undoubted effect of congesting the lungs and brain according to the auricle affected, mainly producing the frightful dyspnœa and brain symptoms which constitute the worst features of the malady.

Of what value is the nitrate of potash in large doses in *acute rheumatism!* I have had no experience of it myself in *acute* rheumatism, trusting as I have done to calomel, opium, Dover's powder, antimony, and, in the worst cases, bleeding; but my friend Dr. Fenwick, of North Shields, who afforded me valuable assistance in preparing the first series of the above cases, when clinical clerk in this house some years ago, as did also Mr. Gibb, informs me that he has adopted it to a large extent in private practice in Shields, and has found it to answer in a remarkable manner. I would also refer you to Dr. Basham's cases of the acute form, and his treatment by the nitrate of potash in large doses—a paper read to the Royal Medical and Chirurgical Society of London, and published in the 'Medical Gazette,' Nov. 24, 1848. His success was great, the urine acquiring a high specific gravity, and the salt being detected in it. The specific gravity was raised to 1030 and 1040, which he thinks was owing to the nitrate, though Dr. C. B. Williams attributes it to the urea and the lithates which are by its agency made to be present in the urine. Dr. Basham states his belief that, owing to its agency in acute rheumatism, there is a certain degree of *exemption* from disease of the heart.

I will conclude this paper (already too long) by recording certain facts and deductions which have manifested themselves to me from the careful investigation I made of the above cases.

In nine cases out of those wherein no relief or only slight relief was obtained, there were either *purulent collections* somewhere, or the usual *common inflammations* which precede suppuration—such as testitis, obstinate conjunctivitis, erysipelas. Are we entitled to deduce from this the general therapeutic principle, that in chronic rheumatism, when it is in that aggravated form in which we have pus circulating in the blood, the treatment by nitrate of potash is not to be depended on, and must be relinquished for another?

Again, in 81 out of the 100, the cure was almost or altogether effected in 14 days by the nitrate of potash in large doses, and these were cases wherein, though severe, there was no suppuration, nor ordinary inflammation of particular organs. It has been before laid down that nitrate of potash acts primarily on the nervous system. May we not infer, then, that those 81 cases were cases in which the nervous system was alone at fault? And, from the two considerations taken together, *may* we not look at rheumatism as a disease composed of two varieties—

viz., that in which its assaults are expended on the nervous system alone, and that other more severe one in which pus circulates in the blood? Various observations and reflections have led me to take this view of the subject. Rheumatism is first a nervous and then a blood disease, and it maintains a distinct individuality in both these phases in a manner more singular than other complaints. In what I call its nervous form it is a kind of Harlequin inflammation, and less mischievous than it seems. A little energy will knock it out of the system: if uncontrolled, it undergoes a transmutation, becomes grave, enters the blood, and changes it, and walks into the heart itself, the citadel of life. At present we want a set of careful microscopic experiments on the blood in all the varied conditions of rheumatism. Last year, at my request, Mr. Gibb took for microscopic examination small portions of the blood of several patients affected with different diseases. In the blood of one who had no trace of inflammatory disease of any kind we found, to our surprise, numbers of pus globules. In a few days there was developed in this patient a severe erysipelas, which finished by becoming phlegmonous. Here, then, inflammatory disease existed in the blood for a certain time without betraying its presence, until at length its increase became such (*vires acquirit eundo*) that nothing but an acute attack upon the skin sufficed for its elimination.

3. In cases wherein *mercury* has been previously extensively taken, and cases where there is syphilitic malady present in the system, whether mercury has been taken or not, the nitrate of potash is without power. The remedy is the *hydriodate* of potash.

4. In cases of general chronic rheumatism, in which *sciatica* is the most painful feature, the nitrate of potash will banish the complaint from the other parts, but will not avail against the sciatica. In this event, *arsenic*, where it is borne, is the most powerful remedy.

5. In cases wherein the symptoms are doubtful, being circumscribed though severe, and simulating such other common inflammations as pleuritis, peritonitis, ordinary cerebral or spinal meningitis, and even spinal irritation and hysteria, the *state of the tongue*, if it appear as if overlaid with a coat of deep or light white paint, so constant in the rheumatic condition, will most essentially guide the diagnosis.—*Med. Gazette, Oct.* 10, 1851, *p.* 639.

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## DISEASES OF THE NERVOUS SYSTEM.

### 14.—ON FATTY DEGENERATION IN ITS RELATION BOTH TO SOFTENING OF THE BRAIN AND APOPLEXY.

By William Frederick Barlow, Esq., Resident Medical Officer of the Westminster Hospital.

[Fatty degeneration of the arteries is one of the most important points to be noticed in relation to ramollissement of the brain.]

Among the facts which might be adduced to show that obstruction of the larger vessels can give rise to ramollissement, two cases, observed and recorded by Mr. Vincent, wherein that affection succeeded to the tying of the carotid artery, may be well mentioned. The frequent concurrence of degeneration of arteries and apoplectic effusion has long been known. It is remarked by Mr. Gulliver that, "in a man who died of this disease, the coats of the arteries of the brain, even of the smallest branches, were studded with and made fragile by fatty patches." Professor Rokitansky, whose observations rest upon immense experience, alludes especially to fatty degeneration of the middle coats of arteries in cases of this affection, and says of the well known changes of those vessels:—"Hence it may be inferred that the more minute arteries, and even the capillaries within the brain, are in a similar condition; especially as the former are sometimes found ossified, and the brain filled as if with silver wires." But microscopical research was wanting to place the state of the minute vessels beyond dispute; and I must refer to the observations of Mr. Paget, who not long since published an important paper 'On Fatty Degeneration of the Small Blood-vessels of the Brain, and its relation to Apoplexy.' "It cannot (he observes) but be that this affection should constitute a predisposition to apoplexy, whether occurring in its simplest form or in connection with cerebral softening." Rokitansky, speaking of disease of the vessels

(and assuming, as I suppose, the implication of the minute ones), observes:—"Such a state of the coats appears to some extent necessary as a cause of apoplexy; for it is often observed that the deepest congestions, whatever their nature, but especially those intense mechanical ones which give rise to cyanosis, do not produce apoplexy." It is, doubtless, in those cases wherein fatty degeneration of the smaller vessels of the brain exists that the impeded return of blood from the organ, so much insisted on by Dr. Marshall Hall, is peculiarly dangerous. And it would be of much moment to know whether some of those cases of epilepsy which pass into, and end mortally by, apoplexy, are not thus fatal because of the small cerebral channels being so diseased as not to be able to resist that distension which the convulsion brings. Let it be always remembered that, whatever may be the bad effects of degeneration of the easily discernible vessels, it is as nothing compared with that of the minute ones: from hence escape those disastrous effusions which either paralyse or strike with apoplexy. That fatty degeneration which is here referred to means, not a simple *addition* of fat merely, but implies the damage or destruction of the tissues proper to the affected vessels. No longer are they safe channels for the blood to course through; their condition is such that hæmorrhage may surprise at any moment, or softening insidiously begin. But let us turn to Mr. Paget's clear description of it:—"When the fatty degeneration has made much progress, changes in the structure, and, not rarely, changes in the shape also of the affected vessels may be observed. The chief change of structure appears to consist in a gradual wasting of the more developed proper structures of the vessels. Growing fainter in apparently the same proportion as the disease makes progress, the various nuclei or fibres are at length altogether lost, and blood-vessels of even 1-150th of an inch in diameter appear like tubes of homogeneous pellucid membrane, thick-set with the fatty particles. The structures of the vessels are not merely obscured by the abnormal deposits: they waste and totally disappear."

What is the state of the minute vessels in cases of capillary apoplexy wherein patches of hemorrhage are numerously interspersed throughout the softened tissue? Fatty degeneration of the minute vessels would, in all probability, be found in many of them, and especially in the immediate neighbourhood of the effusions. Dr. Hughes Bennett, in his "Pathological and Historical Researches on Inflammation of the Nervous Centres," speaks repeatedly of exudation-granules coating the vessels of the soft portions of the brain; but Mr. Paget has remarked that Dr. Bennett's "attention being directed primarily to the changes of the structure of the brain itself, and to the products of inflammation in it, he appears to have less minutely examined the state of the blood-vessels in the diseased parts. Some of the appearances produced by fatty degeneration are represented by him (in the Edinburgh Medical and Surgical Journal, vol. lviii. pl. v. fig. 56, and very accurately in vol. lix. pl. i. fig. 5); but he refers them to the vessels becoming coated externally with exudation-granules, the products of inflammation." I need not say what a point of magnitude is started here in reference to a theory of causes of the ramollissement. A very elaborate writer on this affection, M. Durand-Fardel (as cited by Dr. Hughes Bennett) has gone the extent of saying that "softening connected with sanguineous infiltration, is a proof of inflammation." But the observations of Mr. Paget, to go no farther, would imply this statement to be erroneous.

Rokitansky says that "there is no single cause that will account for the frequent repetition of attacks of apoplexy in many individuals, and its simultaneous appearance at several different spots in the brain, but the presence of disease of the vessels. This also partially explains its happening symmetrically* in corresponding portions of the brain at the same or nearly the same period."

But now I come to a point which touches the diagnosis of cerebral affections. A knowledge of the *constitutional tendency* is, it is superfluous to state, of the highest consequence in the investigation of disease. We judge often of what a particular part of the body may be doing, by what the whole body seems disposed to do; much, as in the moral world, we interpret an *act* by what we know of the *character*. Now, in the study of diseases of the brain, the pathological tendency

* Probably the most unvarying form of symmetrical degeneration is that instanced by the arcus senilis.

often demands the closest inquiry, as the tuberculous affections of that organ well show. Obscure head-symptoms occasionally come before our notice, which may portend nothing of moment, or threaten apoplexy. If apoplexy shall be proved, as I doubt not it will be, an extremely common consequence of fatty degeneration, any clue to the probable progression of the latter in the cerebral vessels will be plainly of value. And may we not find it in the *arcus senilis*, which Mr. Canton has proved to be one form of such degeneration, and often associated with other kinds of it? In several cases of apoplectic effusion, which I have lately met with, the arcus senilis has been very palpable; and, so far as my observation at present leads me, I should, in certain cases wherein it seems doubtful whether apoplexy be foreshadowed or not, lay considerable stress on the presence or absence of this arc, and the rather if a fatty heart were suspected with reason, or signs of degeneration of the kidneys were evident. I believe, too, that the arcus will be found, to *some* extent, diagnostic of ramollissement, especially of that form of it which slowly progresses, and without any well-marked symptoms of inflammation. Whether it be so or not demands inquiry at any rate.

The arcus has already been found of utility in the investigation of heart-disease; and this makes it the more reasonable to believe that it will be of service in exploring affections of the brain.

Mr. Canton found, very early in his inquiry, that the arcus senilis, and fatty degeneration of the heart, existed together, and so frequently as to show that the one might be a clue to the presence of the other.* Dr. Williams and Dr. Quain have both tried the arc of the cornea as a diagnostic sign, and bear strong testimony to its use in the investigation of heart affections. That use will, *cæteris paribus*, be found the greatest where it appears considerable before its time; but its amount has yet to be determined by inquiry. Sometimes the arc is seen so soon, that it may be properly termed an arcus *juvenilis*—an expression which has been already used.†

A great part of the interest connected with the whole subject of fatty degeneration lies in its universality, just as its danger consists in its liability to damage, perhaps prematurely, parts necessary to life. See, too, how many phenomena, and what varying consequences, it may produce! Now it encircles the cornea, now stops the heart, now leads to apoplexy, and now (may we not surely say?) to softening of the brain. Mark, moreover, its extreme commonness. Is it not better well to study it than some morbid affection of rare occurrence and strange anatomy? Its relation to many obscure diseases of the nervous system will be found great, I doubt not; and we cannot but believe this, seeing that there is no organ, no part which it affects, that it does not influence *very* commonly. Nor will it be the key only to infirmities of body, but to weaknesses and aberrations of the mind. By involving opposite parts at once, it makes imminent more than one kind of dissolution. It may *simultaneously* impair the irritability of the heart, and damage severely the minute blood-channels of the brain; and could a pathologist bring before his eyes the exact condition of the two organs, he would perhaps be enabled to say which would be the more likely to destroy—the sudden arrestation of the heart's action or the apoplectic seizure. All its effects upon the muscular system alone have not been traced as yet. May it not damage the *intestinal* contractility, and so lead to one form of obstinate constipation, and one more especially prevalent in old age?

In speaking of fatty degeneration, I have, of course, borne in mind the wide

* "I have in no instance found this senile arc, when well developed, unaccompanied by fatty degeneration of the heart."—'Lancet,' May 11th, 1850. Dr. Latham, in his lectures on Diseases of the Heart, vol. ii. p. 166, points out the difficulty of diagnosing a fatty change of the organ, and insists on the importance of attending to the "constitutional peculiarity;" it is as an indication of this that the arcus will be proved of value, in *helping* us to be "able during life to conjecture a fat heart with such strength of probability that we almost know it." See Dr. Ormerod's Observations on Fatty Degenerations of the Heart, for some remarks in reference to its diagnosis and history, "Medical Gazette," 1849.

† By Mr. Wilde. Mr. Lawrence has noticed the arc (instead whereof a most complete *circle* often happens) at thirty-three years of age; Mr. White Cooper, at twenty-eight. Mr. Canton has seen it beginning at sixteen (See Part ii. of Mr. Canton's Observations). Dr. Quain tells me that he has observed it well marked at seventeen. Mr. Gulliver says of fatty degeneration of the arteries—"though most common in old age, it was twice seen in subjects not past twenty-one, and once in a boy of sixteen." It would be of great interest to examine the small vessels of the brain in cases of *early* apoplexy. Its most usual time of occurrence has been treated of by Dr. Quain, who has analysed a large number of cases in his "Observations on Cerebral Apoplexy, at different periods of life."

difference between the deposition of fat on a part or about it, and that serious change which necessarily implies both damaged structure and impaired action. In Dr. Quain's representations, hardly less full of instruction than their originals, this difference is admirably drawn. The pathological consequences of that fatty deposit which takes place at the "expense and detriment" of the heart's substance are seen at a glance, for fat is not irritable like muscular fibre, nor will it, like it, respond to stimuli and propel the blood. "The heart is a muscle," as Dr. Latham phrases it, "and its functions flow from its attributes as a muscle;" and this may be advantageously remembered by any one who is at a loss to discover why so much stir, as he may term it, should be made respecting the conversion of its fibres into fat.—*Med. Gazette, July* 11, 1851, *p.* 55.

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## 15.—PERIOSTEAL DISEASE AFFECTING THE DURA MATER.

By Dr. R. H. Goolden, Oxon. Assistant Physician to St. Thomas's Hospital.

1. The dura mater is supposed to be very little liable to disease, except as the result of injury, or in connexion with strumous softening of the petrous portion of the temporal bone, or with abscesses about the ear, or as the effect of syphilitic poison; and this poison, supported by some of our best authorities, seems to have diverted attention from a very common affection of this membrane, of the same character as the periostitis which gives rise to nodes on the tibia or cranial bones.

This partial affection of the dura mater, to which I wish to call the attention of the profession, may or may not coexist with general periosteal disease. It is part of the same morbid state, and it has no necessary connexion either with syphilis or with mercury, though these poisons, and especially the latter, greatly favour its development. Indeed the worst cases that I have an opportunity of observing have been those who, in the tropics, have taken large quantities of mercury for fevers or hepatic disease, often many years previously, and have been afterwards exposed to cold and damp in our more northern latitudes.

2. When I held office at the hospital-ship *Dreadnought*, these cases were both very severe and very common, and I have no doubt continue to be so. They give way, at least for the time, to very simple treatment—viz. iodide of potassa, with sarsaparilla, blisters or issues to the head, and full doses of opium every night, with a good nutritious diet—in the same way as periosteal nodes are known to do. When the pericranium is the seat of the disease, it is at once recognised by the presence of great tenderness, as well as unevenness to the touch; but when the dura mater is affected, this morbid condition is not so palpable; it is, however, evinced by unmistakable symptoms. The patients are often free from pain during the day, but at eight or nine o'clock at night the pain sets in, and is so agonizing that they are willing to submit to any measure for relief. It lasts till three or four o'clock in the morning, followed by a profuse perspiration, when the patient gets some sleep. The intermittent character, and the time and duration of the paroxysms, are very remarkable. For some time the cerebral functions are not impaired, but at length the sufferer complains of a constant headache, though not so severe as during the paroxysm; he holds his head forward, with his brows knit; then follow occasionally epileptic fits, weakness of the lower limbs, paralysis, and the patient becomes greatly emaciated, despondent, and suffers colliquative perspirations.

3. Some years ago, a sailor, who had frequently been a patient in the *Dreadnought* for such attacks as I have described, was accidentally killed by falling between two ships in the river. This afforded Mr. Busk, my colleague, an opportunity of examining the head, when it was found that the inner table of the skull was greatly thickened, and also the dura mater.

4. Such is the most marked and aggravated form of the disease occurring in patients debilitated by climate, mercury, purpura, or syphilis, which no one would fail to recognise as identical (except in situation) with periosteal disease, when it attacks the tibia, ulna, cranial bones, crest of the ilium, &c., in the form of nodes, and for which the iodide of potassium seems to be the appropriate, if not specific remedy.

*5. Although* this aggravated form of periosteal disease of the dura mater is most

common in sea-port hospitals, where the patients have been for the most part exposed to *all* the predisposing causes, yet observation has convinced me that it occurs also in a milder form, and therefore more likely to escape recognition, as the cause of many distressing headaches, ultimately leading to epilepsy or paralysis, or at all events reducing the sufferer to the most distressing state of debility; and patients so suffering apply to us for relief in our daily practice, both in hospitals and in private life. Such cases I have met with, both as out and in-patients of St. Thomas's Hospital, as servants in the employment of the Great Western Railway, and in private practice.

6. These cases are marked by headache, having its regular nightly paroxysms, morning perspirations, and gradual emaciation. The patients have mostly been treated for dyspepsia, rheumatism, gout, neuralgia, brow ague, and often for phthisis. I have several times been called upon to examine such patients' chests, as they were supposed to be obscure cases of phthisis, having, in addition to the above symptoms, some cough and bronchial murmurs; but by the peculiar expression of countenance, the pain and wakefulness during the first part of the night, the true nature of the disorder has been recognised.

7. A blister to the head, opium at night, and iodide of potassium and sarsaparilla during the day, have dissipated all the symptoms, and the patients have returned to their usual occupations.

8. It is interesting to know what becomes of these patients. The great drawback to the results of our hospital practice is, that we cannot infer that a patient is permanently cured, because we do not see him again. On the Great Western Railway I have had an opportunity of watching the results. I have found that some have had no recurrence of the attack; others are subject to relapse after various intervals, but are always relieved by the same remedies; others are attacked by periostitis in its more generally recognised form; others are relieved only so long as they continue to take the iodide of potassium.

9. The connexion of this disease with epilepsy is often more intimate than is generally supposed. Without pretending that it is an universal cause, as we know that intestinal irritation and direct injury to the bones will produce epilepsy, it is as well, in obscure cases, to bear in mind that this is a possible cause, and one capable of being to a considerable extent, if not entirely, removed.

Having endeavoured to show that periosteal disease of the dura mater is a frequent cause of a very severe form of headache, and leads occasionally to serious consequences, such as epilepsy and paralysis, I now purpose to offer the results of a more general induction from cases of *periosteal disease*. In adopting the name periosteal disease, I must disclaim any intention of asserting a theory as to the seat or nature of the disease itself. I have rejected the usual term *periostitis*, because I do not consider that there is any ground for concluding that the periosteum is more than secondarily affected, and certainly it is not always inflamed; and with every reluctance to change names, from the confusion necessarily attendant on such changes, I think we cannot too soon abandon those which are theoretical and involving doubtful theories. Without venturing to assert positively that the disease in question has its seat more properly in the bone than in the membrane, I can refer to cases where inflammation and suppuration of bony structure without nodal deposit, have been attended with intermittent pains of great intensity, relieved only by the trephine; and as far as we can form an opinion of pains endured by others, the quality of the pain seems to be very similar, although we have no positive proof of inflammation of bone in nodal disease.

The following laws are the inductions of my own clinical observations.

1. There is a morbid condition of the human body, giving rise to congestion of the periosteum, including the dura mater, with deposits of earthy matter between the membrane and the bone.

2. This morbid condition is properly a specific disease existing in certain constitutions, which may either remain latent or be called into action by external influences.

3. These influences are mercury, purpura, fevers, or any cause which depresses the vital force or germ-life, and especially exposure to cold, damp, and absence of sun-light.

4. Iodide of potassium has a specific influence in arresting the diseased action,

but not of curing the morbid diathesis, which is always liable again to become active whenever the vital force is lowered.

5. There are some constitutions which take on this diseased action readily after a very small quantity of any mercurial preparation has been administered. Nor is there any influence so powerful in its production as mercury, (a reason for its having been so often regarded as a symptom of secondary syphilis.)

6. It occurs at all periods of life, in both sexes, and in virgin as well as married women—(this is a simple matter of statistics.) Prostitutes and their male associates being more liable to periosteal disease than others, does not so much indicate a venereal origin, as it indicates the co-operation of many exciting causes, viz.—mercury, night exposure, mental distress, dissipation, and destitution. I can refer to many cases of periosteal nodes in young women whose social position affords the strongest ground of confidence in the absence of a syphilitic taint, as well as in boys before the age of puberty, in which there was every assurance that syphilis had no share in their production. I have now two well-marked cases in Luke's ward, of the respective ages of thirteen and fourteen, and I have pointed them out in private practice, to the satisfaction of able and experienced medical practitioners. Such cases taken separately may not satisfy some of my professional brethren, who believe in the universal depravity of the human race; but when taken altogether, the probability becomes as nearly positive as the inductive process can render it; for it is highly improbable that boys, and even young girls, can suffer from syphilis without applying for relief, and that, of all secondary symptoms, periosteal nodes should so often remain as the only trace of syphilitic taint. It is argued that the parent's sins are visited upon the children; but surely such an assertion is merely conjectural, and requires more proof than is offered; though we may readily admit the influence of syphilis in parents in developing hereditary disease in the offspring, by its lowering the power of the germ-life.

7. The disease, in its state of activity, is indicated by local pain and wakefulness, commencing for the most part from eight to ten o'clock every evening: towards morning the pain abates, and is succeeded by perspiration; and it is attended with gradual emaciation. The period of the commencement of the paroxysm is remarkable, and a good index of the nature of the complaint, but I have cases recorded where patients have been wakened from their sleep by the paroxysm at a much later time, and I have two well-marked cases where it commenced between eight and nine in the morning; one of these is now under treatment. She lives at Woolwich, and had been treated for brow ague; quinine, steel, and emetics, as well as aconite as an external application, had been tried without relief, ague prevailing greatly in that locality. Profiting by the failure of former treatment, which I might otherwise have adopted myself, I gave the iodide of potassium, with some mistrust in the result: but the very marked relief, after seven months of constant suffering, has confirmed my diagnosis. The exceptions are sufficiently numerous to prove that the exact time of the accession of the paroxysm is an accident, rather than a property, of periosteal disease, though sufficiently frequent to be of great practical value, and therefore I say, "commencing *for the most part* from eight till ten o'clock every evening."

8. The locality of its development is very uncertain, but may be wherever the periosteal membrane extends, whether over bone or cartilage, dependent upon some variable predisposing causes. The most frequent localities are the cuticular surface of the tibia, of the ulna, the cranial bones, the sternum, clavicle, ribs and cartilages, the crest of the ilium, but very frequently in other less obvious situations. To these I shall refer presently.

9. During the paroxysm, the periosteum is greatly congested, and very sensitive, a deposit of bony matter taking place at each paroxysm.

Before the experiments of Dr. Robert Williams upon the use of iodide of potassium in St. Thomas's Hospital were generally known, it was common in very severe cases to cut down upon the periosteum, and to divide it. When a dresser at St. Bartholomew's, I remember to have seen several instances in which this was done, and, as I was then taught, for the purpose of relieving the tension caused by the node. The bright crimson colour of the membrane was remarkable, and this colour was considered a proof of its inflammatory state. However, I believe it is now admitted that the remission of the paroxysm is an evidence that

the pain is not dependent upon tension, which would be a constant cause; and that the congestion of membrane is a normal state under some circumstances, as in young bone during its development from cartilage, and about injuries where reparation is necessarily attended with the deposit of new bony matter. Moreover, the membrane itself is often relaxed as well as thickened over the node. Also, I must observe that the nodal deposit is usually softer, and contains less earthy matter, than the bone itself. With a tolerably sharp penknife it may be often cut off from the bone, the hardness of the bone protecting it from being injured by the knife; but the degree of hardness varies according to the nature of the bone, the age of the patient, and the duration of the node. There is reason to believe that when inflammation occurs, suppuration is the consequence, and then a separation of the membrane. This occurs occasionally, and I have observed it several times at the lower end of the femur and at the carpal end of the radius, requiring the pus to be let out; but I cannot find that I have met with it in other situations, nor do I remember to have done so; and it is very remarkable how very seldom, comparatively, suppuration takes place.

I shall conclude with a few words upon the diagnosis. The ordinary modes are too obvious to need any remark; it is only when the disease is less palpable that there is any room for mistake, and I shall refer to a few such instances.

The upper end of the humerus and the lower end of the femur are very common seats of its development, and often overlooked. The shoulder is aching, tender, cannot be moved on account of pain; there is no perceptible swelling, (the swelling occurring under the covering of the deltoid and the biceps, near the joint;) the muscles are extenuated for want of use; the pain is more severe in the night; there is no effusion in the joint, and the patient keeps the shoulder elevated; the muscles being inserted into the periosteum, we can easily account for the pain on moving the joint. The pain occurs at first in nightly paroxysms only, but there soon follows a state of permanent congestion or subacute inflammation, which I believe rarely extends to the joint, though in two cases, after all pain even on movement had subsided, the movement of the joint was limited by adhesions. Such results are very rare indeed. The hip joint is liable to a similar affection, but it is not so common. These cases are particularly amenable to remedies. The iodide of potassa is given three times a day; and when of any long standing, blisters or issues are necessary to relieve the chronic inflammation, which I believe to be the result, rather than the essence, of the proper diseased action. I very much prefer the nitric-acid issue; it is applied by dipping a piece of lint, the size of the issue required, into strong nitric acid, and applying it, not too wet, to the tender part; it is best to place it anterior to the joint; then it should be covered over with a piece of lint, saturated with carbonate of soda, which will prevent its spreading beyond the desired extent; the pain so produced is considerably less, and of shorter duration, than that produced by caustic potassa, and it is less formidable than the moxa. It is then covered with a linseed poultice, or cotton-wool, moistened, and covered with oil-silk. The slough usually comes away in five or seven days, and the discharge will continue till the pain is quite removed; but it must be borne in mind that blisters will give no permanent relief, unless the iodide of potassa is given internally.

I must also refer to some painful swellings of the tarsal and metatarsal, as well as carpal and metacarpal bones, often observed to remain after attacks of gout, when all active signs of gout have subsided,—and I believe sometimes mistaken for gout,—and to the known success of the iodide of potassa in relieving the pain. These swellings of the fingers and wrists are very different from chalk-stone deposits, though they disfigure the hands. They are very common in advanced life, and then they rarely subside so as entirely to restore symmetry of form. But the same observation holds good in all other forms of periosteal deposit; that is to say, although the activity of the disease may be arrested by iodide of potassa and blisters, the absorption of earthy matter in old age is much more difficult; the pain will subside, but the tibia and frontal bone still retain the swelling and unevenness.

Another set of periosteal deposits is on the fangs of the teeth, causing the most agonizing toothache, without any apparent decay of the teeth. The fang of the tooth becomes thickened, too large for the alveolar cell, and, when drawn, the

membrane shows unusual vascularity, and there is a deposit of dentine, softer than the fang of the tooth, and may be cut with a penknife (as I mentioned in the case of nodes), between the membrane and the fang, giving it bulbous form, and rendering it difficult to extract without breaking. This is not uncommon after mercurial salivation; but it is observed sometimes where mercury has not been given; and I am told by Mr. Stokes, of Lower Brook-street, who shewed me many specimens of such teeth, that he has observed them in ladies who have taken metallic remedies for a continuance—especially salts of iron. But it is a question for still further enquiry, whether those patients had not been suffering under periosteal disease, and that steel had been given for the relief of headache, and remittent pains about the chest and other parts—sometimes for neuralgia—all dependent upon this state of the system.—*Lancet, May* 16, *p.* 149, *and August* 23, 1851, *p.* 174.

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## 16.—ON THE TREATMENT OF CONVULSIVE DISEASES.

By Charles Bland Radcliffe, M.B.

[Dr. Radcliffe first alludes to the hygienic measures to be adopted, and he says, in considering the treatment of convulsive affections, we should first endeavour to secure a pure atmosphere and a free exposure to the sun. Then with regard to the diet; is it to be generous or frugal? After discussing this question at some length, Dr. Radcliffe determines decidedly in favour of the former. Next, as to the expediency or inexpediency of stimulants? He says it is well known a glass of wine is an excellent remedy for the shivering occasioned by cold, and that it is always equally efficacious in the tremulousness of old age, and that it is very likely to afford relief in a paroxysm of chorea. It appears also, he says, that the dram drinking of the lower classes (when restrained within the bounds of moderation) is of use in counteracting the pestiferous atmosphere of close and ill ventilated habitations. He also instances its value in subsultus, in cases of fever, in delirium tremens, in tetanus, and hydrophobia; though rather of a negative character in these cases. In the convulsive affections induced by certain mineral poisons, in those cases of agitation of the heart and body generally, which refer to exhaustion, and particularly to hemorrhage. In hysteria it is well marked, and even in epilepsy Dr. Radcliffe says that no unequivocal benefit has been shown to arise from the treatment where stimulants have been withheld. Lastly, is active exercise admissible or not? In answer to this question the author states that any exercise bordering upon fatigue is to be avoided, for until the muscles have received their tone so as to be able to resist involuntary contraction, it is natural to conclude we should not carelessly throw away what strength they have in voluntary efforts.]

The medicinal treatment of convulsive affections involves the consideration of many debateable points, and it is very difficult to arrive at the possession of any fixed and constant principle of action: indeed, it is only possible to do this by a careful and separate examination of the nature and effects of the chief forms of remedial agents. And to this, therefore, we will endeavour to apply ourselves.

1. Our first enquiry shall be into the merits of the measure which occupies the head of the list, namely *bloodletting*. Now, in doing this, it may be said, without any fear of contradiction, that bleeding would never be thought of as likely to relieve the tremulousness of delicate or aged persons. Experience has also decided against this remedy as a means of cutting short the initial rigours of ague or fever, or the cramps of cholera,—in which latter case, indeed, it rarely happens that the blood will flow if a vein be opened; and whatever doubt there may be at the onset, vanishes towards the sequel; for no one could be mad enough to resort to it for the relief of subsultus. Again, there is no imaginable benefit to be expected in the agitation or epileptoid convulsions consequent upon hemorrhage. And, in catalepsy, there would scarcely seem to be any more likelihood of good resulting from it than in the rigidity of actual death.

Bloodletting is manifestly improper in the greater number of chronic or hysterical subjects. At times, indeed, the circulatory powers may be somewhat active, and the symptoms those of excitement rather than of convulsion; but it

does not follow that, because bloodletting may be then expedient (which is by no means certain,) that it is so in the convulsive forms of the malady. There are cases of epilepsy, also, in which all are agreed that no blood can be spared with impunity, but in the majority an opposite opinion is entertained. It would appear, however, that the practice has greatly changed of late years, and is still in process of change, and that the lancet is now resorted to with far more hesitation than formerly. Attention, indeed, would seem to have been drawn to the fact that an attack is very apt to follow accidental or intentional hemorrhage, and that a like result is the invariable attendant upon death in the shambles; and, on the other hand, faith seems to have been shaken as to the benefits resulting, even when the depletion has been very carefully guarded. Cases illustrating the first doubt are related in great numbers in medical writings, and are of continual occurrence in every-day practice. A few months ago, for example, I was called to a youth residing in Paddington, who had been under my care for some time, and who had almost recovered from a liability to frequent and severe epilepsy. He had a violent fit, and this had followed immediately upon a very free hemorrhage from a wound which he had inflicted on his hand with a chisel. Since this accident the fits have been as frequent as they were before, and the loss of blood is the only cause to which I can assign the relapse. In another case of epilepsy occurring in the same neighbourhood, which had been relieved in like manner by a generous plan of treatment, and in which the fits had been absent for nearly two years, a relapse took place during a visit to the country, within a few hours after a free bleeding, which had been thought advisable to relieve some acute and accidental mischief. Another objection to this mode of treatment is also to be found in the fact, that convulsions are most violent where the system is most emptied of blood and most debilitated in other respects, and that coma, and not convulsion, is the most characteristic phenomenon in sanguineous habits; and hence he should argue, that any measure which would lessen the vascular fulness would be likely, *ceteris paribus*, to increase the liability to the epileptic seizure. We do not object to blood-letting, therefore, merely because convulsion is the consequence of excessive hemorrhage, but on this ground also, namely, that the severity of the attack would seem to be in proportion to the impoverished character of the blood and the emptiness of the vessels.

Many, however, will agree in discountenancing the use of the lancet, and yet at the same time contend that local bleeding is attended with great advantages. It seems to me, however, that the arguments against the one are equally against the other, and that to reason differently savours somewhat of the times anterior to the discovery of the circulation. Moreover, it not unfrequently happens that the advocates of this practice find it necessary to associate it with tonics; and this itself is a great objection, for if the one be necessary (if we reason upon ordinary rules) the other is unnecessary,—and not only so, but injurious. Nor can it be urged that local depletion is needed for the relief of congestion; for, supposing such a state to exist, it has been shown to be not the cause of the disease; and even granting this, it may be objected that the mere taking away blood, by increasing the general debility of which the congestion is symptomatic, would be more likely to aggravate than relieve the evil.

It would appear, therefore, that there is a great mass of direct evidence against bleeding in these affections, and, on the other hand, we can find no proof that certain benefit has resulted from the practice. Indeed, as we shall see in the sequel, the voice of experience is in favour of a contrary plan.

2. The true value of *purgatives* in the treatment of convulsive affections may be ascertained by considering their effect in varied as well as in particular circumstances. In the first place, then, we find no difficulty in deciding upon the question of fitness in persons where the convulsive symptoms assume the form of tremulousness, whether this be in early life or advanced age. Here we find them occasionally necessary to correct a loaded state of the bowels, but beyond this they are not wanted; and this is as we might expect, for the muscular agitation does not depend upon the irritation of any acrid matter lodged in the digestive canal, or upon any plethoric fulness of the vascular system, which might be relieved by a free and copious action of the bowels, but simply upon general delicacy or decline. In chorea and hysteria much good is done by a judicious use of aperi-

ents, in the relief of the obstinate constipation which is so frequent and troublesome a symptom; but we find that the articles selected by experience as best fitted for securing this end are endowed with stimulant and tonic properties. Indeed a most successful plan is to associate some remedy which is a tonic-bitter as well as aperient, as aloes or rhubarb, with some decided tonic. The bowels, in fact, resume their action most readily under means which impart tone to the system generally; and unless this end be secured, anything which merely hastens excretion, will be likely to do harm rather than good, and lead to greater torpidity. Hence, we should argue, that purgatives, as purgatives, are not called for under ordinary circumstances in the treatment of chorea and convulsive hysteria. Again: the history of the shivering, starting, and spasmodic movements, associated with fever, are of like significance. In initial rigours the system presents evident and unmistakable signs of depression, and we should argue, therefore, as to the inexpediency of remedies which themselves are directly calculated to aggravate this state. In cholera, indeed, it would seem as if the consequence of such a practice were shewn to us experimentally, for here we find that the severity of the cramp is in proportion to the purging. It is often found, also, that the subsultus of the latter stages of fever is in great measure due to the exhaustion consequent upon diarrhœa. So that from all points of view alike, the evidence is unfavourable to the use of purgatives in these particular cases. Again: it is found that the movements in the bowels occasioned by these remedies are very apt to intensify the spasms of tetanus. This result is attributed to irritation; but it is equally, if not more reasonable (considering the premises) to suppose it due to the depression resulting from the evacuation, as in cholera or colliquative diarrhœa. Nor is any evidence in favour of purgatives to be gathered from the history of catalepsy, or any other state in which the muscular contraction is continuous.

Unless, therefore, there be a loaded state of the bowels, we find as yet no reason for the employment of purgative remedies in the treatment of convulsive maladies. And, this being the case, we have next to inquire into the rule which applies in epilepsy. Here, then, it is not to be denied, that purgatives are given and given largely, and that an exceeding prejudice exists in their favour; but, notwithstanding this, it is difficult to adduce any satisfactory reasons, either theoretical or experimental, for the practice. We cannot recommend them for the removal of plethoric fulness, for this has been shown to have no existence as a cause of the disease. We cannot recommend them on account of any certain good which their use has produced, for of this there is no evidence. It is well known that benefit has frequently resulted from a combination with tonics, but in this case it is begging the question to ascribe the chief share to the purgatives. It is well known, also, that benefit is almost invariably found in the use of the oil of turpentine; but here, again, the purgative action is quite secondary to the stimulant, at least we may suppose so, for this remedy is much more nearly allied to pure stimulants than to any other class of medicinal agents; and not only so, but the benefit itself, in many instances, is altogether irrespective of any action upon the bowels. Nor does mercury deserve the exception which is so often accorded to it, especially in this country. There are, undoubtedly, innumerable cases in which this drug is of the highest value; but that convulsion is not one of these, may be argued from the known fact, that the convulsive phenomena called mercurial tremblings are actually induced by it, when introduced into the system in poisonous quantities, as is the case in gilders. In fact there is no evidence that any purgative is necessary in epilepsy, any more than in the other convulsive affections, unless to remove some accidental accumulation in the bowels.

[Dr. Radcliffe has previously arrived at the conclusion that the predisposition to convulsion is marked by debility and prostration of the system, and that the convulsion is dependent upon a diminished supply of vital force in and to the muscles. But, he continues,]

It is not sufficient, however, to say that convulsion is connected with debility and prostration, except we can account for the occurrence of this phenomenon in some cases, and the absence in others; and it remains, therefore, that we endeavour to point out the special as well as the general characteristics of this state.

What, then, we may ask, is the ultimate idea at which we can arrive in the investigation of this pathological condition! Is it distinguished by any local affection? That it is not, would appear to be evident in the mere fact, that no one single affection is to be pointed out as a constant and unvarying accompaniment, as well as from other considerations which have been already entertained. Upon this point, indeed, we owe the highest deference to the first physiologist of the age,—but at the same time we must say, that when Dr. Marshall Hall divides convulsive affections into *centric*, or those which refer to the spinal cord for their origin, and *eccentric*, or those which originate elsewhere, he is virtually no longer the advocate for the exclusive claims of that portion of the nervous system with which his name stands connected, and will stand connected so long as physiology is a science. But, be this as it may, we have stated the ground upon which we venture to found our own opinion, and upon this we must stand or fall.

And if there be this absence of any local affection which can give speciality to the convulsive disorder, is there some general characteristic which we have not yet noticed? That there is, and this a satisfactory one, will appear, if we give the subject a little consideration. Thus, we find a remarkable diminution in the contents of the vascular system at the time of the seizure, which diminution would appear to be intimately connected with the subject in hand. Persons apt to tremble in the cold, will find, if they pay proper attention, that the first consequence of the exposure is an abundant secretion of urine, and an almost irresistible necessity to empty the bladder. It is well known also, that a seizure of hysteria or epilepsy is generally ushered in by a similar copious secretion and discharge; and that it is the same in the initial rigours of fevers. Again, women are most prone to hysteria after copious menstruation; and epileptoid convulsions are the direct consequence of excessive hemorrhage. In cholera the urine is suppressed, but in place of this, there is an abundant serous discharge from the bowels; and in the subsultus of the last stages of fever we have most generally a free colliquative diarrhœa. In fact, wherever there is convulsion, we find that the vessels have been emptied to a greater or less degree, either by natural or unnatural secretions, or by direct hemorrhage.

Now, there are certain reasons by which we are led to suppose that this change is intimately connected with muscular contraction. Filling of the vessels of erectile tissue, for example, is as necessary to the state of turgidity, as emptying to the return of the quiescent condition,—in other words, the vessels must be emptied, in order to allow a state of contraction in the irritable fibres of the vascular coats and interstitial spaces. It may be objected, indeed, that this contraction is not that which takes place in muscular structures; but, at the same time, it is to be remembered, that there is a complex vascular web in muscle which differs but little from that which forms the basis of erectile tissue, and which, therefore, may be supposed to be affected in the same way by the removal of the blood, and also that the fibrous parenchyma in each case is allied by so many intermediate gradations, as to be in reality but varieties of the same irritable fabric. The illustration, however, may be admitted, without contending for the analogy, and from it we may understand in some measure, that a full state of the muscular web of vessels may oppose a mechanical bar to contraction in the parenchymatous fibres, and that emptiness will facilitate, if not induce this state.

Here, then, we may perhaps find *one* reason why convulsion does not always attend debility or prostration. At times, for example, a person liable to hysterical fits, being overcome by the sudden communication of some painful intelligence, may fall down in a state of syncope; whereas, if the disclosure had been made gradually, the kidneys, or skin, might have acted freely, and (the vessels having been emptied to the requisite extent) convulsion, and not syncope, have been the result. Again, an epileptic may fall down in coma instead of convulsion, and still the reason be that the suddenness and extent of the disturbing impression has not allowed time for the vessels to part with any of their contents.

It does not concern us in this place to inquire into the ultimate cause of the change of which we have been speaking; but it is worthy of remark, in passing, that it may depend upon a contraction in the fibrous elements of the vascular coats, by which the internal capacity of the vessels is rendered insufficient to hold their former contents; the contraction itself being analogous to that which takes

place at a later period in the interstitial fibrous textures, and referring to the same causes for its origin. In this way of regarding this phenomenon we gain, moreover, some light as to its probable importance, for the emptying of the vessels, whether through natural channels of secretion or by accidental outlets, may be indicative of contraction—*convulsion* in the fibres of the vascular coats, or in the tunics of the ultimate cells. In fact, it may be an initial phenomenon of the convulsive attack.—*Med. Times, June* 14, 1851, *p.* 646; *and May* 24, 1851, *p.* 560.

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17.—*On Muscular Irritability in Cerebral and Spinal Paralysis.*—By Dr. Marshall Hall.—At the meeting of the Academy of Sciences of Paris on the 28th July, 1851, a paper of Dr. Marshall Hall was read, 'On muscular irritability in cerebral and spinal paralysis.' The paper closes with the enunciation of the following facts: 1. There are cases of paralysis where the muscles of the affected limb contract under a less degree of the galvanic influence than those of the sound limb. 2. The contrary takes place in other cases—the muscles of the sound limb are then more sensitive than those of the affected side. 3. In these cases the influence of the brain, or that of the spinal marrow, is respectively intercepted. 4. The removal of the influence of the brain conduces, within certain limits, to a comparative irritability of the muscular fibre; whilst the reverse is obtained when the influence of the spinal marrow is taken off. 5. This difference in the degree of muscular irritability is to be looked upon as a diagnostic sign in cases of cerebral and spinal paralysis. 6. An apparatus which yields a simple and slight current, is alone capable of shewing this difference; and this apparatus, to the exclusion of those which give a current often repeated and of great intensity, is the only one which can be used for the purposes of diagnosis.—*Lancet, Aug.* 16, 1851, *p.* 156.

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## 18.—ON A FUNCTIONAL AFFECTION OF THE SPINE, LIABLE TO BE MISTAKEN FOR ORGANIC DISEASE.

By Henry Kennedy, Esq., A.B., M.R.I.A.

The affection alluded to was essentially a disease of the young, being seen most frequently between twelve and twenty years of age. Dr. Kennedy had, however, met with it as early as nine years, and as late as twenty-five. He had only seen it in private practice, and it was more common amongst males than females, in the proportion of at least two to one. It consisted in a pain in the back, combined with weakness, and this was always referred to the lumbar region; at least he had never seen it higher up. This pain commenced gradually, and might or might not be attended with the feeling of weakness; and occasionally only the latter was complained of. On examining the spine, the patient was nearly always able to refer the suffering to a particular part; bnt Dr. Kennedy had seen cases where the feeling was more diffused. It was worthy of notice, that a rough examination of the part might be made—the spine might be twisted, or percussion strongly used, and yet the patient would not complain. When left to their own feelings, they invariably preferred the recumbent posture. Walking was much less irksome than sitting, and particularly when they had no support for the back. In addition to an ordinary chair, they would use a cushion, so that it might press on the spine where they complained; and even when reclining at full length, they often placed a cushion in the hollow of the back, so as to cause direct pressure. Those whose business led them to stand and work at a desk, seemed peculiarly liable to the affection.

*Case* 1.—Mr. —, a young gentleman of 18, whose employment was in an office in Dublin, where he spent six or seven hours a day, partly standing and partly sitting at a desk, began to suffer from pain in the small of the back. He was of small size, but of a highly developed nervous system, as was shown when he laboured under any common indisposition; as, for instance, a cold. The pain in the back was trifling at first, though constant; so that he was able to pursue his usual avocations for about four months, when it became so distressing that he

was compelled to confine himself to a sofa the greater portion of the day, and when he did sit up, he always used a cushion between his back and the chair. On examination, nothing wrong could be detected with the part of the spine of which he complained most; which was about the third lumbar vertebra. It could be twisted, and otherwise roughly handled, without causing any inconvenience, but he could not sit without support beyond a few moments. When he had any inducement, he could go through an amount of exertion on his feet, which seemed totally incompatible with the other symptoms. His general health appeared good; his tongue clean; his appetite not impaired. He continued in this state for four months, during which time he was seen by the late Mr. Carmichael, and a variety of treatment was adopted. In two months more he had recovered so far as to be able to resume his business, and at a still later period, recovered completely; nor had he since, though some years had passed, suffered from the same affection.

*Case* 2. A brother of the last patient, at the age of 21, began to suffer from pain in the back, attended by a feeling of weakness. He was also in an office where both standing and sitting at a desk was necessary; but it was in a country town. At first, it was merely an inconvenience; by degrees, however, it became worse, so that he could scarcely go through his duties, and finally he came to Dublin for advice. He was seen by Mr. Cusack and Dr. Kennedy, and the symptoms were exactly those detailed in the last case, but not so severe. In this instance there were some signs of dyspepsia. After a certain period, not so long as in the former instance, this patient also got well, and had remained free of any suffering from his back, a period of five years having elapsed.

With regard to the *nature* of this affection, Dr. Kennedy was inclined to say—though it be anything but proved—that it arose from causes incident to the period of life at which it occurred, conjoined with some obscure derangement of the general health. But this was but conjecture.

The *diagnosis* was of some moment; for the symptoms might lead one to dread the existence of serious disease; or it might be confounded with an organic disease. A young lady, while abroad, got the affection. She was advised to keep the recumbent posture, and to have issues put in. This advice was persevered in for some months, when she was brought home, and seen by Sir Philip Crampton, who at once ordered the issues to be dried, and the patient to get up, and go about. This was done and the lady recovered, though slowly; for her general health had been injured by her long confinement. The diagnosis would probably turn on the presence or absence of constitutional symptoms; such as a quick pulse, night sweats, &c. In addition, even a rough examination of the spine did not cause any pain to the patient—a marked contrast between the two cases; and lastly, the situation afforded some assistance; for in the one affection it was, as far as Dr. Kennedy had seen, always in the lumbar region, and sometimes even at one side of the vertebral column; while in the other, organic disease was not probably so common here as higher up.

The *prognosis* is favourable. The patient will get well; but his recovery will occupy some time. Dr. Kennedy had seen no instance where the affection was completely got rid of under six months; and in some of the cases it was much longer. It sometimes returned after the patient had been well for months. To say that no case could run into more serious disease, would be going farther than prudence would justify, for in truth this affection, when well-marked, was sufficiently distressing. But Dr. Kennedy had not met any case of the sort. In one instance, indeed, a patient laboured under it when she was between eleven and twelve years of age. She recovered perfectly, but about two years subsequently was attacked with caries of the cervical vertebræ, which ultimately proved fatal by the disease extending to the membranes of the brain. With this exception—and it was not a case exactly in point—he had known no fatal results in connection with that form of spinal affection under notice.

On the subject of treatment, Dr. Kennedy had nothing very definite to offer. A considerable variety of means had been used, both local and constitutional. The former included local bleedings, dry cupping, blisters, frictions, the cold douche, and galvanism; and the latter, aperients, tonics, change of air, and relaxation from business. Of these two, the latter had in his experience proved by much the

most useful. He had also seen benefit follow the application of small and repeated blisters, as also the use of a weak stream of galvanism, applied daily, or every second day, according to circumstances. The patient, too, often got great relief from wearing a stiff belt. Still the general measures were the most important. In all the severe cases, the patient must give up his business for a time; two or three months' complete relaxation must be enjoined, and if the patient could change his air, so much the better. Exercise, more or less, according to circumstances, should be advised to be taken daily; not of course, to be carried to fatigue: at the same time that the patient, while at rest, might with advantage assume the horizontal position, propped up or supported in the way most agreeable to him. Strict confinement would generally do much more harm than good. Besides relaxation from business, and change of air, the cold douche, frictions, &c., were worthy of trial. As to medicines, Dr. Kennedy had tried a number, more particularly those of the tonic class; excepting strychnine, however, from which in some cases benefit had arisen, they appeared to produce little or no effect.—*London Journal of Medicine, Aug.* 1851, *p.* 776.

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19.—*Brucine in Paralysis.*—It has been said that brucine is possessed of little efficacy, and is a faithless agent, compared to strychnine. M. Brichateau's experience leads to a different conclusion, and as it can be given in far larger doses than strychnine, it is a more manageable medicine. Commencing with pills containing two or three centigrammes, he has in some cases gone as high as 80 c.; but it is rare for such doses to be required. At the dose of from 10 to 15 c. slight jerks and prickings are felt in the limbs, and at from 20 to 25 the jerks are stronger and are accompanied by rigidity of the limbs, which assume a forced extension when the patient tries to walk. There is no cephalalgia or disorder of the mind, produced.—*Med. Times, Aug.* 9, 1851, *p.* 160.

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20.—*Variations of the Sulphates and Phosphates excreted in Acute Chorea, Delirium Tremens, and Inflammation of the Brain.*—By Dr. H. Bence Jones.—[Dr. Bence Jones says, that]

Having determined the variations of the sulphates in the state of health, when different diets, amount of exercise, and medicines were taken, the variations of the sulphates in disease were examined. At the same time, the total amount of alkaline and earthy phosphates was determined, partly in order to see whether the amount of sulphates and of phosphates bore any relation to one another, and partly to test the conclusions which were drawn in the author's previous paper 'On the Variations of the Phosphates in Disease.'

The cases were thus classified:—

1st. Acute and chronic diseases, in which the muscular structures were chiefly affected, as chorea.

2d. Functional diseases of the brain, as delirium tremens.

3d. Acute inflammatory diseases of the nervous structures, as inflammation of the brain.

4th. Chronic diseases of the nervous structures.

5th. Acute diseases, in which neither the nervous nor the muscular structures were chiefly affected.

6th. Chronic diseases, in which neither the muscular nor the nervous structures were chiefly affected.

The three last classes gave only negative results.

In illustration of the first class, three cases of most intense chorea are detailed. The urine was examined frequently from the third to the eleventh day. The phosphates were found to be diminished; the sulphates were present in very great excess. The urine was found to be so loaded with urea that nitrate of urea crystallised out before the urine was concentrated. The specific gravity of the urine was as high as 1036 in one case, 1035 in another, and in the third 1031.

In illustration of the second class, three cases of delirium tremens are given.

The urine was examined from the fifth to the fourteenth day of the disease. The phosphates were not found to be so remarkably diminished as in the cases reported in the previous paper. The sulphates were found to be exceedingly increased. The amount of urea was so great that nitric acid caused an instantaneous crystallization. The specific gravity was, in one case, 1041; in another, 1037; and, in the third, 1027.

In other words, there was the most remarkable correspondence between the state of the urine in acute chorea, and in delirium tremens.

In illustration of the third class, four cases of acute inflammation of the brain are given. The urine was examined from the fourth to the twenty-sixth day. Though the inflammation in these cases was not of so intense a kind as in those which were recorded in the author's previous paper referred to, yet they confirm the statement that in inflammation of the brain the phosphates in the urine are increased; they also lead to the conclusion that the sulphates are at the same time increased in the same degree.

In conclusion, the author states the phenomenon common to acute chorea, and to intense delirium tremens, is increased and unceasing muscular action. The muscles are highly complex organic compounds, in which sulphur exists in an unoxydized state; and the muscular action is accompanied, if not caused, by an action of oxygen, which, among other results, gives rise to the formation of sulphuric acid and urea; the amount of oxidation being proportioned to the intensity of the muscular action. The result produced is an increase of the sulphates and of the urea in the urine, just as in health they would be increased if continued strong exercise was taken. The increased amount of urea does not constitute a disease resembling diabetes, but it is only an evidence of the changes which are taking place within.

The increase of sulphates and phosphates of the brain is also an evidence of increased oxidation of the nervous structures. These simultaneous variations depend on the fact, that the amount of sulphur in the brain is nearly the same as the amount of phosphates.

Thus, at one time we have evidence of increased oxidation of the elements of the nervous structures, and, at another time, increased oxidation of the elements of the muscular structures, and we may thus arrive at the conclusion, that, at one time, the function of the nerves, and, at another, that of the muscles is inordinately increased.—*Med. Gazette, July* 11, 1851, *p.* 81.

21.—*Chorea: Treatment by Chloroform in Frictions.*—Chloroform is an agent which will eventually become an extremely powerful instrument in obtaining very varied results. Since it deadens sensibility, it must calm and even completely appease the different states of over-excitement of the nervous system. We cannot therefore be surprised that Dr. Gassier has performed three cures of chorea by making, along the course of the vertebral column, frictions with a liniment composed of chloroform and oil of sweet almonds, in equal parts. But what is remarkable in these three cases is, that they were all caused by fear. Thus, then, there did not exist any initial morbid state; an accidental nervous derangement was developed on a particular occasion, and nothing more. In such circumstances, chloroform has stopped the chorea; but if the temperament had been concerned, as in cases which are developed without appreciable moral cause, chloroform would not have sufficed, but it would have been necessary to have recourse to other means.—*London Journal of Medicine, August*, 1851, *p.* 722.

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## 22.—CASE OF TRAUMATIC TETANUS.

Under the care of E. Cock, Esq., at Guy's Hospital.

[In the following case, and in several others terminating in the most favorable manner, the administration of quinine seems to have been attended with the most happy results. W. H., aged 18, was admitted on the 28th of January, 1851. His arm had been caught by a machine the day before his admission, and presented an unhealthy looking and jagged-edged wound, about two or three inches in length, on the outer side of the wrist—a good deal of general œdema—but no direct evidence of fracture. Higher up, about the middle of the forearm, was a hard strip of skin, of a peculiar dark colour, half an inch broad, having a very defined upper

border, and extending nearly half round the circumference of the forearm, and having very much the appearance of tough bacon rind. The next day the generally mottled appearance, and the loss of sensibility, announced that gangrene had set in. On the third day the whole forearm was in a state of complete sphacelus. Mr. Cock divided the hard piece of skin, and made numerous incisions from above downwards. Numerous bubbles of gas escaped with a crepitating noise, and the tight band snapped, when divided, like a piece of over-stretched tape. On the 4th day mortification did not seem to have further extended, and on the 6th day was clearly stopped. On the thirteenth day ulceration was found to have gradually progressed above the mortified tissue, so as to form a deep fissure down to the bone, and healthy suppuration, with the formation of granulations, is now proceeding from the tissues above.]

Nineteenth day. Up to this date, since the slight operation above detailed, the patient has continued very well, until to-day, when Mr. Stocker perceived an expression of countenance like that of tetanus, the most obvious symptom being, however, the partial manner in which he opens his mouth when asked to show his tongue. On being questioned, the boy says he feels some stiffness of the jaw. There are marked transverse wrinkles in the forehead from contraction of the occipito-frontalis. The abdomen is hard, and the bowels confined. Pulse increased in frequency, 96. A dose of compound senna mixture was given immediately, and Mr. Cock resolved to attack the disease at once by the tonic plan of treatment. He therefore ordered three grains of disulphate of quina every fourth hour, and the allowance of wine was increased from eight to twelve ounces per diem. On the second day after the first tetanic symptoms, the patient complained of some stiffness of the neck, otherwise there was no material change. Pulse 88. When sleeping, the transverse wrinkles of the forehead were not so much marked. The wound continues healthy, and the bowels have been relieved.

Third day. The trismus is increasing, muscles of the abdomen very hard, but no pain. Pulse 84. Passes a sufficiency of urine.

Eighth day of the tetanic attack. The trismus has gradually increased to this date, and may now be called complete. The patient can merely show the extreme tip of his tongue, and takes food by a spoon with great difficulty; his appetite, at the same time, is very good. As regards other tetanic symptoms, they chiefly consist in some stiffness of the retractor muscles of the head and neck, and an occasional darting pain there felt, as well as considerable hardness of the abdominal walls. Bowels occasionally confined, and acted upon by rhubarb and saline purgatives; passes urine well; stump continues to look healthy, with common water-dressing.

Tenth day. A little more capability of moving the lower jaw now exists: the bowels, however, have become obstinately confined, and strong purgatives and injections are requisite to obtain any action; stump healthy.

Thirty-eighth day. The tetanic symptoms have gradually subsided during the last four weeks, and may now be said to have quite disappeared; the only difficulty has been in obtaining proper action of the bowels. Croton-oil has been found the most serviceable; but since getting up from bed a few days since, and moving about the ward, the bowels have acted naturally. The patient has continued to take the quinine and wine, and the stump has remained very healthy.

April 8th, being the ninth week after admission. Mr. Cock had intended, now that all tetanic symptoms have subsided, to have removed the denuded portion of humerus, and adjusted the naturally existing flaps, so as to form an useful stump; but to-day, on applying very gentle force, a large piece of the bone (consisting of the whole of the condyles and articulating surfaces, and a splinter, one or two inches long, of the shell of the shaft) came away. Nothing further therefore was done, as it was considered that the portion of the bone left was living, and would give rise to granulations, and the formation of an investing tissue.

April 25th, eleventh week after admission. At this date, the patient left the hospital, the bone had become covered by granulations, on a level with those which had arisen from the natural flaps, and which were nearly cicatrized over at the last date. There is now every prospect that the whole will soon be healed, and a very serviceable stump formed.

*About a fortnight* after his discharge, the lad presented himself at the hospital,

when the whole of the stump was found to be covered by a sound cicatrix, and the cure completed; thus furnishing a most interesting and instructive lesson as to the resources of the *vis medicatrix naturæ*.—*Lancet, June* 28, 1851, *p.* 697.

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23.—*Traumatic Tetanus controlled by Quinine.*—M. Coste, chief surgeon of Hôtel Dieu of Marseilles, has published, in 'L'Union Medicale,' the case of a boy sixteen years of age, who was attacked by tetanus in consequence of a contused wound of the toes. The disease was arrested by large doses of disulphate of quinine (maximum forty-five grains in one day), after bleeding, baths, &c., had in vain being resorted to. The cure was accomplished in about a fortnight. If we mistake not, quinine has been used in this country for the same affection, but without beneficial results.—*Lancet, July* 5, 1851, *p.* 10.

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24.—*Tetanus treated by Chloroform Frictions.*—'L'Union Médicale' states that M. Morisseau, surgeon to the hospital of "La Flèche," succeeded in saving a patient seized with tetanus, by using frictions of chloroform all over the body. M. Morisseau had, in two cases previously treated, tried, in one venesection and opium, and quinine in the other: both had failed; and he had thus been induced to make attempts with chloroform. A few accidental vapour-baths, and frequent frictions with the anæsthetic agent, brought on recovery in the space of four days. —*Lancet, August* 9, 1851, *p.* 131.

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## 25.—CASE OF EPILEPSY TREATED BY TRACHEOTOMY.

By W. H. Cane, Esq., Uxbridge.

[In the case of a boatman, suffering under an extreme epileptic seizure, after which he was left in a state of deep apoplectic coma with asphyxia, inspiration being performed only by seldom and short catches, whilst the veins in the head and neck were every where visible, and greatly distended, Mr. Cane, after the patient had remained in this state nineteen hours, determined to perform the operation of tracheotomy; acting upon the suggestion of Dr. Marshall Hall, that as the epileptic or other convulsion implied closure of the larynx with expiratory efforts, the attack of convulsive epilepsy would be prevented by that operation.]

"Feeling convinced," Mr. Cane observes, "that the patient must shortly expire, and that the root of the evil was in the closure of the larynx, I at once proceeded to open the trachea, a matter of no small difficulty, on account of the twisted state of the neck, the engorged state of the vessels, and the constant action of the muscles. The operation of tracheotomy was performed, and the tracheal tube is kept in the trachea to the present time. The relief to the patient was immediate; the air passed into the lungs, the state of spasm subsided, with the turgid condition of the head and neck, and the patient soon recovered his sensibility. This was not the only gratifying result: although the poor man had experienced his epileptic seizures in increasing violence during seven or eight years, and recently thrice a week, he had, on April 1st, during two months, had no return of them. More recent accounts of the patient, who is now in Staffordshire, confirm the former report; the tube is still kept in the trachea, and the epileptic seizures have not recurred."—*Lancet, July* 12, 1851, *p.* 35.

## DISEASES OF THE ORGANS OF RESPIRATION.

### 26.—ON THE DIAGNOSIS OF PHTHISIS.

By Dr. WALTER HARLYLE WALSHE, Physician to University College Hospital, &c.

In speaking of the diagnosis of phthisis, Dr. Walshe lays down the following highly practical and useful propositions:

"(*a*) A young adult who had an obstinate cough, which commenced without coryza, and without any obvious cause, a cough at first dry, and subsequently attended for a time with watery or mucilaginous looking expectoration, and who has wandering pains about the chest, and loses flesh, even slightly, is, in all probability, phthisical. (*b.*) If there be hæmoptysis, to the amount of a drachm even, the diagnosis becomes, if the patient be a male, and positively free from aneurism or mitral disease, almost positive. (*c.*) If, in addition, there be slight dulness under percussion at one apex, with jerking, or divided and harsh respiration, while the resonance of the sternal notch is natural, the diagnosis of the first stage of phthisis becomes next to absolutely certain. (*d.*) But not absolutely certain; for I have known every one of the conditions in *a*, *b*, and *c*, exist (except hæmoptysis, the deficiency of which was purely accidental) when one apex was infiltrated with encephaloid cancer, and no cancer had been discovered elsewhere to suggest to the physician its presence in the lung. (*e.*) If there be cough such as described, and permanent weakness and hoarseness of the voice, the chances are very strong (provided he be non-syphilitic) that the patient is phthisical. (*f.*) If decidedly harsh respiration exists at the left apex, or at the right apex behind; if the rhythm of the act be what I have called *cogged-wheel*, and there be dulness, so slight, even, as to require the dynamic test for its discovery, there can be little doubt of the existence of phthisis. (*g.*) If, with the same combination of circumstances, deep inspiration evokes a few clicks of dry crackling rhonchus, the diagnosis of phthisis, as far as I have observed, is absolutely certain. (*h.*) If these clicks, on subsequent examination, grow more liquid, the transition from the first to the second stage may be positively announced. (*i.*) If there be slight flattening under one clavicle, with deficiency of expansion movement, harsh respiration, and slight dulness under percussion, without the local or general symptoms of phthisis, the first stage of tuberculization cannot be diagnosed with any surety, unless there be incipient signs at the left apex also; the conditions in question, limited to one side, might depend on chronic pneumonia or on thick induration matter in the pleura. (*k.*)The existence of limited though marked dulness under one clavicle, with bronchial respiration and pectoriloquy, so powerful as to be painful to the ear, the other apex giving natural results, will not justify the diagnosis of phthisis. I have known this combination when the apex of the lung was of model health, and a fibrous mass, the size of a walnut, lay between the two laminæ of the pleura. I would even go farther and say, that the combination in question is rather hostile than otherwise to the admission of phthisis, as. had tuberculous excavation formed at one side, the other lung would, in infinite probability, have been affected in an earlier stage. (*l.*) Pneumonia limited to the supra and infra-clavicular region on one side, and not extending backwards, is commonly, but not always tuberculous. (*m.*) Subcrepitant rhonchus, limited to one base posteriorly, is not, as has been said, peculiar to tubercle; it may exist in emphysema, and in mitral disease. (*n.*) Chronic peritonitis, in a person aged more than fifteen years, provided cancer can be excluded, involves, as a necessity, the existence of tubercles in the lungs. To this law of Louis it is necessary to add the qualification, provided Bright's disease be also absent. (*o.*) Pleurisy with effusion, which runs a chronic course in spite of ordinary treatment, is, in the majority of cases, tuberculous or cancerous: the character of the symptoms, previously to the pleurisy, will generally decide between the two. (*p.*) Double pleurisy, with effusion, is not, as has been said, significant of tubercle: for it may depend on Bright's disease. If the latter disease can be excluded, carcinoma and pyohæmia remain as other possible causes. (*q.*) If a young adult, free from secondary syphilis and spermatorrhœa, and not dissolute in his habits, speedily lose flesh without clear cause, he is, in all probability, phthisical, even though no subjective chest-symptoms exist. (*s.*) But he is

not by any means certainly so, for he may have latent cancer in some unimportant organs, or he may have chronic pneumonia. (*t.*) Nay, more, he may steadily lose weight, have dry cough, occasional diarrhœa, and night sweats, and present dulness under percussion, and bronchial respiration under both clavicles, and yet be non-phthisical. I have known all this occur in cases, both when the lungs were infiltrated superiorly with primary encephaloid cancer, and when they contained secondary nodules of the same kind. (*u.*) Failure of weight becomes less valuable as a sign of phthisis, the longer the thirtieth year has been passed. (*v.*) The discovery of cardiac disease with marked symptoms, deposes against, but does not exclude the existence of active tuberculization. (*w.*) The existence of cancer in any organ is unfavourable to the presence of tuberculous disease, but tubercle and cancer *may* co-exist, even in the same lung."—*Brit. and For. Medico-Chirurg. Review, October*, 1851, *p.* 303.

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## 27.—ON THE PATHOLOGICAL SIGNIFICATION OF SOME OF THE EARLY AUSCULTATORY SIGNS OF PULMONARY CONSUMPTION,

### CONSIDERED WITH REFERENCE TO THE PRESENCE OF TUBERCLE.

By Dr. Stanhope Templeman Speer, Cheltenham.

[Dr. Speer does not incline to the general opinion that the pathology of pulmonary consumption, in the widest acceptation of the term, is dependent upon the presence of tubercle in the lung; neither does he think the varied phenomena are one and all to be attributed to this cause. He says:]

That tubercles do exist in the large majority of cases, characterised by all the symptoms of the disease, is undeniable: that they are the primum mobile, or promoter of such symptoms is, to say the least, extremely doubtful. I am, on the contrary, inclined rather to consider this affection as a scrofulous inflammation of the lung, and to attribute its symptoms to the ordinary results of this process, modified by the peculiar products, which, in the majority of cases, are the results of this peculiar form of inflammation.

It has been asserted by many writers (and more especially by some of the most eminent of the French pathologists) that in no case can tubercles be considered as the product of inflammation; and M. Louis, in his able work on Phthisis, has brought forward numerous examples to prove the fact. On careful consideration, however, of these cases, it would appear that he has merely proved that an ordinary inflammation, whether of the bronchial mucous membrane or of the pulmonary parenchyma, never tends to the deposition of tubercle. It is needless, however, to say that inflammation is not a process limited to one exact type: true, in its usual form, it proceeds generally to the formation of healthy pus, or organizable lymph; but, on the other hand, are not the rheumatic, the gouty, and the syphilitic inflammations, each marked by products of a different character, and by a variety in their symptomatic phenomena? and are we not, then, at liberty to assume that there exist certain conditions of the body of an inferior grade of vitality, with a tendency to a corresponding type of inflammation equally characterized by a similar grade of action, giving rise to the production of a deposit incapable of complete or further organization? Such appears to be the case as regards the deposition of tubercle in very many instances. Not but that, on the other hand, it may happen that this peculiar inflammation will sometimes go on to the destruction of the tissues involved by suppuration and disintegration, while after death no trace of tubercle can be discovered, but only that peculiar kind of product which, in other parts of the body, is denominated scrofulous pus.

Upon this point I may venture to quote the following apposite remarks from so eminent an authority as Dr. Graves. He says:—"The most important thing for the student to impress on his mind with regard to all cases of phthisis is, that the pectoral symptoms, of whatever nature they be, are caused by scrofulous inflammation. If you trace the phenomena of external scrofulous abscesses, you will be struck with the close analogy they bear in their manner of appearance, their progress and termination, to the ulceration of the lungs. The same slowness; the same insidious latency; the same gradual solidification and gradual softening; the

similarity of the puriform fluid secreted in each; the analogous occurrence of burrowing ulcers and fistulous openings; the close approximation in the form of their parietes, and the difficulty in healing remarked in both, make the resemblance between them extremely striking." Again, he says,—"I mentioned before that one of the first morbid changes we generally see arising from the scrofulous habit is the formation of tubercular matter. I have also alluded to another of these morbid changes—namely, the production of scrofulous pneumonia, in which we cannot detect the existence of a single tubercle. There is another process in which the scrofulous inflammation is seated in the bronchial mucous membrane. This latter form of phthisis is sometimes associated with phthisical pneumonia, but it often exists without it. Although in this disease the inflammation is seated in the bronchial mucous membrane, it differs very much from common bronchitis: its symptoms are different; it does not run the same course; and it is unlike common bronchitis in its termination and cure: its fever presents all the material phenomena of phthisis—emaciation, and frequently the same incurability; the same means tend to its aggravation or benefit, and the same scrofulous pus is secreted."

Now, if we admit the existence of these different forms of scrofulous disease affecting the lung, either separately or (what is more commonly the case) in conjunction,—namely, scrofulous inflammation leading to the deposition of tubercle; scrofulous inflammation (pneumonia), in which no trace of tubercle is found after death; and scrofulous bronchitis, in which a characteristic purulent fluid is found filling the tubes; allowing, I say, these three forms to exist, and that either of them may, at its origin, prove to constitute the incipient stage of phthisis, we have then some clue to the diversity in those morbid physical phenomena which are collectively supposed to indicate the disease without specifying its peculiar form; for while the general symptoms may, in all probability, be nearly identical, it is obvious, from the different pathological conditions which must exist in these three varieties, that a corresponding difference in the physical signs must necessarily be present. Thus two cases, equally deserving of the term phthisis, as meaning a wasting away, with destructive disintegration of the pulmonary tissues, may in reality afford a difference in the progress and existence of such signs (more especially at their commencement) in no way to be accounted for but by the admission of a pathological difference in the morbid processes at work in the two cases.

The foregoing observations are made in the conviction that the disease called phthisis pulmonalis is in reality a scrofulous inflammation of the lung; that it is, in the large majority of cases, accompanied by the deposition of tubercles; but that in certain forms of the disease (especially in elderly persons) this is by no means invariable; and that when present, they are the product, and not the real cause of the disease; since all the characteristic symptoms of scrofulous inflammation are identical, whether true tubercle be thrown out or not—viz., low fever, quickened pulse, emaciation, hectic, perspirations, diarrhœa. To be satisfied of this, we have but to compare a case of hip-joint disease in its progress from first to last with one of pulmonary consumption: the analogy will be indeed evident.

It is, however, true that sometimes the deposition of a considerable amount of tubercular deposit may take place in the lung, preceded merely by simple congestion or capillary hyperæmia,—a condition supposed to be always present by Vogel and by Engel; the latter, however, limiting the influence of inflammation to the production of infiltrated tubercle. May not, however, this deposition at so early a stage of the inflammatory action be merely a proof that there exists in persons of an eminently tubercular diathesis, a step short of actual inflammation (viz., simple hyperæmia), sufficient in itself to provoke the deposition of tubercle from its blood-vessels; whilst in others the process must attain its ultimatum—the true inflammatory condition (of a scrofulous type)—before the characteristic deposit of such type becomes manifest.

Again, it is often alleged that the fact of tubercles (isolated or in masses) being not unfrequently found in the lungs of persons dying of other diseases, in whom the parts occupied by these tubercles, and surrounding them, were to all appearance healthy, is a proof of their deposition being independent of any inflammatory process. I have myself frequently seen tubercles in the upper part of the lung, lying apparently inert, surrounded by healthy tissue; no symptom of inflammatory *degradation* being appreciable: but the absence of such appearance by no means

satisfied me that an early stage of inflammation—viz., hyperæmia—had not preceded the deposition; it rather goes to prove that tubercle does not produce of itself any change in the surrounding parts, and that the suppuration and disintegration of the pulmonary tissue found around it in cases of phthisis, are in no way a necessary consequence of irritation produced by the tubercle, and may exist totally independent of its presence.

The appearance of tubercle without any trace of inflammation in its vicinity is, as I said before, no proof of the absence of such process at the time of its deposition. In assigning inflammation, however, as the *avant courier* of these latent products, I allude simply to its incipient stage, that of local excitement, with increased flow of blood, but without organic change; and consequently the absence of any indication of such process is explicable upon the following supposition:—That (in persons, who, after death, presented evidence of latent inert tubercle), owing to a combination of depressing causes greatly lowering the vital powers, a condition of simple irritation or congestion was sufficient to give rise to the deposition of a certain amount of tubercular matter from the vessels of the congested part; and that these vessels, once freed from this material, and the predisposing causes giving rise to its formation in the blood having ceased, returned to their former condition without any advance in the morbid process, which, owing to a combination of circumstances, had at so early a period been sufficient to permit of its exit from the pulmonary capillaries. Should, however, its elimination require a process of a more advanced type for its accomplishment—viz., actual inflammation—we at once see how the peculiar symptoms of phthisis may become manifest. In the first instance the morbid action ceased upon the deposition of the tubercle; resolution took place, and the substance remained inert; in the second, the usual results of inflammation followed or accompanied such depression—namely, suppuration, and ulceration of a modified type; not, indeed, resulting from the presence of the tubercle, but from the fact that the process having now attained the inflammatory stage, the ordinary consequences of inflammation will of necessity occur whether tubercle be thrown out or not; these consequences—the suppuration and ulceration, and not the tubercle—leading to the softening and destruction of the tissues in which the latter has been lodged.

Lastly, if tubercles are to be considered as the primary cause of the irritation, inflammation, and other symptoms which are presupposed to occur subsequent to its deposition, there is some difficulty in understanding why the lung, and especially its upper lobes, should be so peculiarly obnoxious to their existence; but if we allow a state of hyperæmia to have preceded their deposition, the difficulty is in a great measure removed; for, in the first place, it is only necessary to bear in mind the delicate structure of the lungs allowing the easy exudation of the materies morbi through the thin texture of its capillaries. The mass of blood which passes through them as compared with other organs; the chemical change in that fluid which takes place here, and here alone; the abundant formation of fibrin (of which tubercle is but an inferior form); and, to add to these conditions, the fact, that of the different organs in which tubercles are found, the lungs alone are subject to those external peculiarities of atmospheric vicissitudes, so fertile in inducing an irritable congested state in tissues of so delicate a texture. Abrupt changes of temperature are universally allowed to favour the development of pulmonary affections, and more especially of phthisis, in persons predisposed to the disease; but surely it must be by the variety in the intensity of stimulus afforded to the pulmonary tissues, producing an excited irritable condition, and thus leading to the deposition of tubercle, rather than by any specific action possessed by such atmospheric influences in promoting its deposition, independent of a preliminary morbid process, however slight.

The above considerations may serve to explain the reason for tubercular matter being so generally found to preponderate in the lungs: its choice, however, of the upper lobes is more obscure.

Now it is well known that tubercle may be deposited with little, if any, derangement in the circulation of the part; but when this does occur, the deposit assumes the form of crude yellow tubercle from the first, without having been preceded by the grey miliary induration, from which, in the majority of instances, it appears to have been formed. But this primary form of crude yellow tubercle, which appears

to be so independent of any preliminary irritating process, is not that which is found to predominate in the upper lobes: it is the miliary tubercle and the grey induration which are so common in these parts of the lung in the earlier stages of phthisis; and these latter conditions being undoubtedly the result of a low grade of inflammation, the question is not why the upper lobes should be so liable to this deposition, but why they should be more particularly so, to that species of inflammation which gives rise to it; since (notwithstanding the frequency of ordinary pneumonia of the lower lobes, and also of one form of bronchitis—the capillary) it is certain that the upper portion of the respiratory apparatus is far more liable to irritation, congestion, and inflammation, of one kind or another.

In the first place, these upper lobes are the seat of a higher degree of activity in the respiratory process; the louder character of the murmurs is one indication of this; but this superior activity of function is also a sign of a corresponding activity in the circulation of these parts. This alone would render the upper lobes more keenly susceptible to the irritation of external stimuli, independent of the existence of a tubercular diathesis; but as this condition of the system has the effect of implanting a lower degree of vitality and proportionately diminished powers of reaction in all the tissues, it is plain that those of the upper pulmonary lobes must now be more incapable of resisting with impunity the varied sources of irritation to which they are liable. Another reason tending to account for this susceptibility is found, I think, in the opinion of Broussais, that in these parts the bronchial tubes are shorter, and allow the external sources of irritation to arrive more readily at their termination. This argument certainly holds good with respect to the atmospheric air, if its temperature be low or variable, since, owing to the shortness of the space which it has to traverse, it cannot have its temperature increased or assimilated to that of the surrounding parts, so readily as when it has to attain the more distant portions of lung. Again, in spite of the superior activity of the respiratory functions in the upper lobes, it is in these that the least amount of assistance to the alternate expansion and contraction of the lung is afforded by the movement of the thoracic parietes, the deficiency requiring to be compensated for, by an increased action in the lungs themselves; and that such an active condition of certain of the pulmonary tissues does occur, independent of the movement of the thorax, has, to my mind, been satisfactorily shown by the elaborate researches of Reissenen and others. Lastly, this diminished mobility may, according to Dr. Williams, act in another way:—he says, "the smaller capability of motion possessed by the upper lobes of the lung may have a share in disposing them to become the seat of tubercular matter, not by permitting it to accumulate, but by favouring bronchial obstructions to the respiration, and causing local congestions of blood, which may promote the formation of tubercles."

Before proceeding further, the following propositions may serve to embody the views entertained upon this subject:—

1st. That the tubercular and scrofulous diathesis are identical.

2d. That inflammation of the pulmonary substance is modified by this diathesis; its products being either scrofulous pus or what may be termed scrofulous lymph or tubercle; both these products being possessed of an inferior degree of organization.

3d. That in the great majority of instances the earliest phase of phthisical disease is ushered in by local excitement of the air-vesicles and smaller air tubes.

4th. That this local excitement differs essentially from the analogous condition existing at the commencement of an ordinary sthenic inflammation, in its gradual supervention, its difficulty of recognition, and its slowness in passing into a more advanced stage.

5th. That all the symptoms of phthisis are the result of scrofulous inflammation of the lung, whether pus or tubercle be thrown out, or both.

6th. That where the tubercular diathesis is very strongly marked, tubercle may be deposited, as the result of a very trifling amount of local irritation.

7th. That in a large number of cases it is not deposited, till the morbid process has attained the true inflammatory stage.

8th. That the auscultatory signs of incipient phthisis may be divided into—1st, those which occur in cases where the tubercle is thrown out simultaneously with *or subsequent* to the local excitement; 2dly, those in which it is not deposited till

this stage of excitement has become merged in actual inflammation of a specific character.

Lastly. That incipient phthisis may present all its characteristic symptoms before any tubercular matter has been hitherto eliminated.—*Med. Gazette, June* 13, 1851, *p.* 1027.

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28.—*Symptoms of the First Stage of Phthisis.*—[From a concise practical guide to the physical diagnosis of Consumption.] By Dr. R. Payne Cotton, Assistant Physician to the Hospital for Consumption and Diseases of the Chest.

The following are laid down by Dr. Cotton as the signs of the first stage of phthisis.

Bulging of the infra-clavicular origin, with increased or diminished resonance.

Retraction of the same region, with imperfect resonance.

Imperfect expansion. Elevation of the thoracic parietes must not be confounded with their expansion.

Increased vocal fremitus.

Increased distinctness of the heart's sounds under the clavicle.

Jerking or rough inspiration.

Prolonged or bronchial expiration.

Pulmonary crumpling sound, or a few dry crackling rhonchi. The signs of bronchitis limited to one or both apices.

In determining the importance of these signs, it must be borne in mind that expiration, as shown by Louis, is, in a certain proportion of healthy individuals, somewhat prolonged, and the vocal fremitus and resonance comparatively strong under the right clavicle.—*Med. Times, April* 19, 1851, *p.* 431.

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## 29.—OBSERVATIONS ON THE FORM AND MOVEMENT OF THE CHEST IN PHTHISIS.

By Dr. Richard Payne Cotton, Assistant Physician to the Hospital for Consumption and Diseases of the Chest.

[Dr. Cotton's observations lead him to believe that the best formed chests afford no security against the onset of the disease; and the ill-developed or even deformed chest does not seem more liable to become the seat of tubercle. Before considering the form as influenced by phthisis, he gives a brief reference to the relationship between phthisis and tubercle. He remarks:]

There is a period of disease, sometimes well-marked, but equally often so short and ill-defined that it escapes detection, which may be termed the *preliminary* stage; it might be called with more propriety the *first* stage, but this title has been too long applied to a somewhat later period to admit of being changed. Consumption has now commenced. The tuberculous elements exist in the blood, but are not yet separated from it in the form of tubercle. This period passes into the tubercular or *first* stage; in some cases the tubercle is formed very rapidly; but in others, it may take months, or even years, for its accumulation to any notable amount.

The tubercular deposit consequently should be considered as the *effect* of phthisis, and as bearing precisely the same relation to this disease as the lithate of soda does to gout; and, just as a patient may be gouty without having the movements of his joints affected by "chalk-stones," so may any one be phthisical without having the functions of the lungs interfered with by tubercle. The really phthisical symptoms, at the commencement of the disease, depend, not upon the state of the lungs, but upon the morbid condition which has produced it. It is true, that in the latter stages, much of the patient's suffering is a direct consequence of the pulmonary disease; but, at an earlier period, the general features of the malady—the weak and quickened pulse—the languid expression—the perspirations, &c.—depend entirely upon the *phthisis*, not upon the tubercle.

From this view of the subject it must follow, that phthisical symptoms may present themselves in connexion with every possible degree of pulmonary disease,—

from a few scattered tubercles, which are scarcely appreciable, to their accumulation in considerable masses; and that *incipient* phthisis is not *always* discoverable by a physical examination of the chest. If this had been more fully admitted by writers upon these subjects, the stethoscope would have been often spared unmerited discredit.

We will assume, however, that the disease has fairly reached its *first* stage, and that the tubercular deposit is sufficiently abundant to interfere with the proper functions of the lung. In what manner is this exhibited by physical signs? Are the form and movements of the chest necessarily altered? These are questions which cannot be answered by an appeal to individual cases, on account of the well-known Protean character assumed by the disease, and are only to be met by continued observation upon such a scale as an hospital, like that at Brompton, can alone afford.

As a general rule, the form of the chest is unchanged, and the action of its two sides are symmetrical. In a few instances, there is a slight bulging over the diseased part, but, owing either to its rarity, or the shortness of its duration, it is not very often to be detected. Auscultation and percussion are now the sole guides to the condition of the lungs—points, however, upon which it is not my present object to enter.

I have always been aware that such a statement may be met by the very plausible argument, that directly the apex of a lung becomes tubercular, it must necessarily lose some of its capability of being expanded, and, as a natural consequence, the portion of the thoracic walls corresponding with the seat of the disease, must undergo a change in form, and be less moveable than the opposite side. But I think it can be shown how it happens that, in most cases, neither of these alterations are immediately apparent, and that the chest may retain, for a time at least, its healthy form, as well as its long-accustomed habit of equal and simultaneous motion.

There are two ways by which it does so, viz.: 1. The movement of the healthy side becomes diminished to the same extent as the other, so that the ordinary breathing, instead of being partly costal, as we find it in health, is almost wholly abdominal. 2. The pulmonary cells in the immediate neighbourhood of the tubercular deposit become enlarged, and by increased capacity for air, compensate for those which are disabled.

The first is less common than the other, but its occurrence may be witnessed in certain cases (of which I have seen many examples), where, although it is evident from other signs that one lung only is affected with tubercle, the thoracic movement upon both sides is small but equal, except on very deep inspiration, when the diseased side is less raised than the other. The second may be seen in the many cases of early phthisis, in which the respiratory sound upon the diseased side is actually louder than on the other, and in the still more numerous instances, in which the murmur at the tuberculous apex is scarcely audible in some points, and morbidly loud in others; both of which conditions must be familiar to every experienced auscultator. It is probable that the first takes place in cases where *miliary* tubercle is scattered throughout the greater part of the lung's apex; and the second, where the tubercular deposit is in somewhat larger masses, and accumulated in particular spots.

The occasional bulging over the diseased part, first observed by Dr. Chambers, is yet additional testimony in favour of the second explanation; for when the portion of the chest so altered is percussed, it is often found to be more resonant than the healthy side, apparently in consequence of an extreme degree of enlargement of the pulmonary cells, amounting to emphysema.

But, after a time, which varies very much in different cases, circumstances are entirely changed; the diseased portion of lung *begins to contract*, and the thorax undergoes an alteration in form, not only in the region of the clavicles, but in its whole contour. M. Fournet referred this contraction to secondary pleurisy; Dr. Stokes has attributed it to atrophy of the lung; and Dr. Walshe has added to these, the contraction of plastic matter exuded into the pulmonary tissues. It is probable that these different causes are sometimes associated; but one or more of them must be present, before the form and action of the chest can be materially *interfered* with.

In the majority of phthisical cases, their effects begin to appear towards the middle or latter end of the first stage; but examples are sufficiently numerous of their being completely absent until softening has commenced.

I shall describe the several changes which are thus produced, as they are seen when in their extreme; premising, that the greatest variety will be met with, both in the rapidity and extent of their development.

The vertebræ of the neck and back are inclined forwards, and the shoulders are rounded; the front of the chest is consequently contracted, and the stature of the body lessened, giving an awkwardness to the whole appearance, difficult to describe, but which any one accustomed to the external aspect of the disease, would at once refer to the *tubercular chest*. If the patient be looked down upon whilst he is sitting, two curves are distinctly visible; the one affecting the whole line of the cervical and dorsal vertebræ, the other crossing it, and formed by the two shoulders inclining forwards. A depression is visible beneath one or both clavicles, giving to these bones the appearance of prominence, and, posteriorly, the supra-scapular region over the diseased part is more or less sunken inwards. During ordinary breathing, either there is no costal movement whatever at the upper part of the chest, or there is a difference in its extent upon the two sides, and, on forced respiration, instead of the peculiar *swelling* movement of the infra-clavicular regions which is so characteristic of health, either one side is elevated more than the other, or the entire chest is raised, as it were, in one mass, without being perceptibly increased in the antero-posterior diameter of its upper part. These latter changes are more conspicuous in females than in males, as the healthy respiration in our sex is principally abdominal; whilst in females—owing to the restriction of stays, or for reasons which the obstetrician is the best able to appreciate, there is greater freedom of movement in the upper ribs, and the breathing is, to a much greater extent, costal.

The loss of symmetry and healthy movement take place simultaneously; so that, unless there is some depression in the clavicular or supra-scapular regions, there will be no diminution in the ordinary movements of these parts. M. Fournet was, I believe, the first who drew attention to this circumstance; and I have certainly never seen an exception to it.

The changes above described may occur at any period of phthisis, from that antecedent to softening, to that of large vomicæ: but they are very capricious guides to the actual stage of the disease; for persons with cavities in the lungs very often are less altered, in these respects, than others who have scarcely entered the second stage. The different amount of pulmonary contraction which must accompany different cases, will at once account for these varieties.

From the preceding observations, I think it must be evident that inspection and mensuration of the chest can seldom afford assistance in the diagnosis of *incipient* phthisis; although, as the disease advances, they may prove useful auxiliaries to other physical signs. But when it is remembered that a departure from strict symmetry is occasionally seen in healthy persons, as a consequence either of congenital peculiarity, or of certain pursuits which influence the development of the thorax, it is obvious that much caution is always necessary in their employment.—*London Journal of Medicine, July*, 1851, *p.* 616.

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## 30.—ON A PECULIAR APPEARANCE OBSERVED IN THE GUMS OF CONSUMPTIVE PATIENTS.

By Dr. Theophilus Thompson, F.R.S., Physician to the Hospital for Consumption and Diseases of the Chest.

[Dr. Thompson was encouraged to examine the state of the gums in a poisoned or morbid condition of the blood, from the value of their indicating the presence of lead in the system, by the blue line upon their edge.]

He presents the result of his observations in reference to this inquiry in cases of consumption, and avows his conviction of the frequent existence in phthisical subjects of a mark at the reflected edge of the gums, deeper in colour than the adjoining surface; in some patients a mere streak on a raised border, in others, a margin more than a line in breadth, of a vermillion tint, inclining to lake; the

mark being most distinct around the lower incisors, but usually observable in both jaws, and often around the molar, but modified in its situation by the form of the mouth. The author has examined some hundred cases in the course of the investigation, and gives the analysis of 102, of whom he has full records. In forty of forty-eight women the gingival margin is present; and in fifty-four phthisical men, although in a few the line is so faint as to be open to question, there is only one in whom it can be considered decidedly absent. He has reasons for suspecting that the same condition of the system which produces this state of the gums tends also to produce clubbing of the fingers; but he considers that the change in the extremity of the fingers rarely occurs till some time after the streak is manifest in the gums. Of seventy-six patients, forty-five were found to have clubbed fingers; of these forty-five only one had gums free from the characteristic margin; yet twenty of the seventy-six had marginated gums, but no expansion of the extremities of the fingers. The author discusses the effect of various modifying influences, such as hereditary tendency, catamenial disturbances, and habits as respects cleanliness, but cannot connect the presence of the symptoms in question with any of these circumstances; but he is of opinion that causes which irritate the mucous membrane tend to accelerate and increase the manifestation of the margin. He suggests this as an explanation of the more frequent absence of the line in women than in men, and dwells on its practical importance, as indicating, in such cases, the use of refrigerants as preliminary to the introduction of tonic remedies. The author canvasses the question whether a similar line exists in any other disease; he allows that M. Fredericq may be correct in the opinion that certain changes in the gums occur towards the close of various chronic diseases, but he has never yet observed the peculiar margin described in this communication, without detecting other indications of consumption, although frequently only incipient. As respects prognosis in phthisis, he proposes the general rule, that cases in which the streak is observed early, or is broad or deep-coloured, tend to proceed more rapidly than those in which it is absent or slight; whilst freedom from the streak, even in the third stage, affords encouragement in treatment. In reference to diagnosis, the author believes,—1st. That the absence of the streak in men affected with inconclusive symptoms of phthisis, may incline us to a favourable interpretation of any such suspicious indications; but that in women, rather less weight is to be attributed to this negative sign. 2nd. That the presence of the sign in women is almost conclusive evidence of the presence of the tubercular element in the blood. The paper concludes with the remark, that the symptom therein described is one of many proofs that consumption is *not* exclusively a local disease, but rather a constitutional condition, requiring for its elucidation and treatment far more than an acquaintance, however exact, with the phenomena of auscultation.—*Lancet, July* 12, 1851, *p.* 35.

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## 31.—ON HÆMOPTYSIS.

By Dr. Theophilus Thompson, F.R.S., &c.

[Although great alarm is generally evinced, and danger of sudden death feared when this symptom is considerable, yet it appears in reality that such is very rarely the case, for]

There are two circumstances in reference to the circulation in phthisical lungs unfavourable to the occurrence of profuse hemorrhage. In inflamed lung, the blood-vessels, though tortuous, are free, but in tubercular lungs the blood coagulates in the extremity of the vessels. But there is an additional point well worthy of your attention. When you look at this large vomica you observe a considerable band passing across it. Of what does this band consist? It contains no bronchial tube. Bronchial tubes readily ulcerate; and by that process expectoration from cavities is promoted. The band consists mainly of blood-vessels and cellular substance. Blood-vessels are inapt to ulcerate. The walls of the pulmonary arteries, when surrounded by tubercular ulcerations, instead of sharing the disorganization, usually thicken; by the deposition of fresh material, their calibre gradually lessens; after a time they cease to be pervious, they are filled with a thin, reddish, fibrin-*ous plug,* and transformed into solid chords.

It is probably only in those rare instances in which such a vessel is suddenly torn before the calibre is perfectly closed, that fatal hemorrhage is at all likely to occur. The popular idea that all bleeding from the lungs is produced by ruptured blood-vessels is a serious error. The ordinary cause of hæmoptysis is doubtless compression or obliteration of the pulmonary veins by the tubercular deposit; in consequence of which, blood, interrupted in its natural channels, overflows or exudes into the neighbouring bronchi. If this explanation be correct, hæmoptysis moderate in amount must be regarded rather as beneficial than alarming. By preventing the stagnation of unhealthy blood it must tend to oppose the extension of tubercular disease; and as far as a conclusion may be drawn from the cases under my care, the tendency of hæmoptysis of considerable amount would seem to have been rather favourable than otherwise. You will observe that some of the cases recorded of copious hæmoptysis, were remarkably slow in their progress. In six of the cases the quantity of blood expectorated at once has exceeded a pint, and the time which has elapsed since the occurrence of the profuse hæmoptysis has been, in these patients, respectively six months, twenty-two months, twelve months, ten months, eight months, and five years; in several of these instances, evidence of pulmonary disease preceded by many months the occurrence of hæmoptysis, and in some the disease has not advanced beyond the first stage. These facts are in harmony with my general experience, as showing that this symptom tends more to retard than to accelerate a fatal issue.

The practical bearing of these facts is obvious and important, as impressing the conclusion that undue haste to arrest hæmoptysis should be deprecated, and that as a general rule it is better to moderate this symptom by producing determination to other organs, than to employ direct astringents. You will find great benefit in many cases from the administration of a dose of calomel or mercurial pill, with henbane, followed by the use of half-drachm doses of sulphate of magnesia with diluted sulphuric acid, administered twice a day.

Let me repeat, that hæmoptysis, when slight, is often useful and should not be hastily checked. When it is considerable, if of an active character, as indicated by full, hard pulse, heat and oppression under the sternum, and heaving of the diaphragm, cupping or even bleeding, may be requisite. In less formidable attacks, anti-congestive remedies, and small doses of sulphate of magnesia with sulphuric acid may be given, or antimony with nitrate of potash. Ipecacuanha has been recommended, in doses of two grains every quarter of an hour, but this remedy has disappointed me. If the hæmoptysis be passive, direct astringents may be required, of which alum is one of the best; and perhaps this remedy acts more efficiently when allowed to dissolve in the mouth than when taken in mixture. The following prescription is appropriate for this purpose:—Take of powdered gum-arabic and of white sugar, each three drachms; powdered tragacanth, a drachm and a half; alum, two drachms; catechu, three drachms; rose-water, as much as sufficient for a mass to be formed into sixty lozenges.

The most powerful of direct astringents in the treatment of urgent cases, is acetate of lead. You may give two grains for a dose in a mixture, with half a drachm of distilled vinegar; or if you give it in pill, take care to give acetic acid immediately afterwards, in order to counteract the tendency of the carbonate of lead to produce colic. Gallic acid is not so prompt and effectual as acetate of lead, but suits some cases remarkably well. Turpentine is probably one of the most certain and suitable remedies in a majority of instances. Two drachms of spirits of turpentine, two ounces of mixture of gum arabic, and four ounces of infusion of matico or of cinnamon water, with thirty minims of tincture of capsicum, form an appropriate mixture, of which an ounce may be given at intervals. In slight cases the infusion of matico alone is often sufficient.

When the hæmoptysis is associated with suppressed catamenia and hysterical symptoms, lytta is of great value; but let me repeat the opinion, that in a majority of instances of phthisis moderate expectoration of blood is useful, and that whilst you allay the apprehensions of the patient you may leave the symptom to its own course.—*Lancet, July* 19, 1851, *p.* 53.

## 32.—ON EXPECTORATION AS A MEANS OF DIAGNOSIS IN DISEASES OF THE CHEST.

By Dr. Theophilus Thompson, F.R.S., &c.

[It is now known that the old supposition, that the presence of pus in the expectoration indicates the existence of phthisis, is totally incorrect, as it may be present in bronchitis and yet absent in consumption. But we must be mindful of the danger of falling into the opposite error, and discarding a symptom which may be of great value to us.]

There are certain general rules worthy of regard in connexion with this subject. Thus, if a person with some severe chest complaint coughs frequently, and expectorates only frothy, salivary-looking fluid, you suspect pleurisy. If another patient expectorates a glairy fluid, resembling white of egg, you suspect bronchitis; if the expectoration have a rusty tinge and resemble gum-water coloured with blood, you are not likely to err in recording pneumonia; if you are told of a sudden expectoration of a gush of pus in considerable quantity, especially if it be fœtid, you would expect to find that matter accumulated in the cavity of the pleura had found its way into the bronchial tubes.

We have said that purulent expectoration may occur both in bronchitis and in phthisis. When, however, long-continued purulent expectoration is unaccompanied with any distinct rhonchus, you may be tolerably certain that the source is a vomica, and not the bronchial tubes. Let us consider to what extent we may derive aid in our diagnosis of the existence and stage of phthisis, from examination of the sputa. We must not expect too much from this, or indeed from any other single symptom. Phthisis may proceed to an advanced period unaccompanied with expectoration, or the expectoration may be for a time suspended, especially under the successful employment of medical treatment.

In this patient, for example, S. A. M., whom you formerly examined, you have unquestionable proof of vomica in the cracked-metal sound, which you readily detect by making smart percussion in the second left intercostal space, but there is scarcely any cough, and that cough is dry. Still there are certain common circumstances regarding phthisical sputa, which may be briefly detailed. A member of a consumptive family feels a little out of health and has a dry morning cough; after a time the cough is attended with slight expectoration, at first salivary, after a short period becoming viscous, but transparent and homogeneous, subsequently dotted, and then streaked with blood, the striæ becoming by degrees more abundant. After a longer or shorter time, whitish opaque spots appear, the size of a pin's head, rounded or flattened, giving a pearly aspect to the expectoration. These multiply and enlarge, and ultimately form masses of an opaque white or dark grey colour, varying in size from that of a lentil to a two-franc piece, irregularly rounded and chequered at the side, sometimes streaked with blood and floating in a viscous transparent fluid. At a more advanced period of the disease, the expectoration is purulent, spreads out into a porraceous mass, and shortly before death is often surrounded by a pinkish halo.

The changes thus described do not necessarily occur in so uniform a manner; but the most characteristic appearances of different stages of the disease may probably be best illustrated under four divisions—namely, first, the salivary or frothy; secondly, the mucous; thirdly, the flocculent; fourthly, the purulent or porraceous. The first is what you would expect from irritation, the result either of pulmonary congestion or of slight tubercular deposit; the second would indicate a more confirmed affection of the bronchial tubes; the third is peculiarly characteristic of secretion from a vomica modified by the absorption of its thinner constituents; the fourth is indicative of phthisis far advanced, and (if unmixed with froth) usually involving both lungs. Let us see how far such a representation is in harmony with the facts at present accessible in the hospital. I show you some examples of simple frothy expectoration. The first is coughed up, in the quantity of four ounces in the twenty-four hours, by the patient I now introduce. W. G., aged forty-two, a post-boy, admitted into the hospital, Nov. 18, 1850, says, he has been for eight years subject to asthmatical cough; fourteen months since observed some streaks of blood in his expectoration, and during the last fourteen months has been losing *flesh;* pulse, 84; respirations, 28 a minute; height, five feet two inches and a half;

vital capacity 140. These circumstances are sufficient to make you suspect the nature of the disease; at the same time the local signs are so slight—being almost confined to the existence of a little dulness on percussion at the apex of the right lung, and rather strongly pronounced breathing under the left clavicle—that we may reasonably come to the conclusion, in harmony with the appearance of the expectoration, that the disease is in the first stage, and not at present considerable. The second variety of expectoration is mucous, viscid, transparent. Two very good examples are before you. This patient, W. D., expectorates half an ounce daily of this kind of fluid; he is a gardener, has no hereditary liability to phthisis, and attributes his complaint to bad diet. He began to cough last August, and at that time expectorated about half a pint of salivary, frothy fluid in twenty-four hours. This patient's pulse is 78; height, five feet four inches; vital capacity, 155. The upper part of the left chest expands less than the right during inspiration, and is rather dull on percussion. The expiratory murmur is prolonged, being equal to the inspiratory at the apex of each lung. There has never been hæmoptysis. The disease is evidently rather more advanced than in the patient previously introduced to you; but as yet there is no softening of tubercle, and the expectoration depends on bronchial irritation. W. D.'s expectoration contains a little blackish matter, resembling what is often supposed to owe its origin to carbonaceous matter abounding in the London atmosphere; but the colour fades on the addition of nitric acid. It cannot therefore be carbon; it is rather the black matter of pigment cells, known to be formed under slight, not under severe, forms of bronchial inflammation. On applying a little heat, and examining this expectoration with the microscope, crystals, apparently of triple phosphate, may be seen. By the politeness of Dr. Garrod, I am able to show you another microscopical preparation of triple phosphate expectorated. It is from a patient in whom a strong impression had been entertained of the existence of phthisis. Dr. Garrod, however, ventured to pronounce the affection bronchial. The progress of the case has established the correctness of his diagnosis, and serves to confirm an opinion I am inclined to entertain, that the proportion of salts in the expectoration appears to be in an inverse ratio to the degree of inflammation present. Such an opinion is at least in harmony with the interesting observations recorded by Mr. Brett in the 'Transactions of the British Association for the Advancement of Science' in 1837. As an approximation to the proportion of saline matter in the solids expectorated, we may mention from twenty to thirty per cent. in catarrh, from fifteen to twenty in the more opaque mucus of chronic bronchitis, and rather less than ten in the puriform expectoration of advanced phthisis.

Dr. Babington found that the addition of common salt after a time converted pus into a viscid mass like mucus. Dr. Golding Bird perfected the analogy by adding soda to pus, and then transmitting through it a current of carbonic acid. (Guy's Hospital Reports, No. 6.) Chemically speaking, then, the watery, frothy-looking secretion of our first division is chiefly serum; the second, or mucous, is albumen mixed with saline material; the fourth, or purulent, the blood-globules devoid of their colouring-matter, combined with coagulable albumen; and the third, or flocculent, has the mixed character, varying according as the principal proportion of material is supplied by the vomica, or by the bronchial tubes.

It is the third variety of expectoration, however, to which I am specially anxious to direct your attention, because with scarcely any qualification you may regard it as pathognomonic of phthisis. When spat into water you observe it assuming the form of globular masses, like little balls of wool or cotton. Some of these masses have subsided, some are suspended at different depths, others float on the surface, sustained by bubbles of air, entangled in the surrounding mucus. Similar expectoration spat upon the plate has taken the form called by the French nummular, being in flattened, rounded, separate masses, and assuming a shape not unlike pieces of money.

Some of the patients from whom these specimens were obtained are before you. Examine J. E——; you hear in the right subclavicular region two or three distinct clicks accompanying inspiration and expiration. This is humid crepitation, and so good an example of the clicking variety as to give appropriateness to the term of "clicking rhonchus," suggested, I think, by my colleague, Dr. Cotton, as applicable to this conclusive sign of softened tubercle.

E. P—— has distinct indications of vomica, and the cavernous gurgling attending her cough, heard under the left clavicle, accords with the information supplied by the ragged flocculent masses floating in her expectoration.

We have now shown you progressive changes for the worse: let me indicate the reverse alterations characteristic of amelioration.

When the process of contraction is going on in a vomica, a diminished quantity of expectoration is a common and a favourable symptom.

C. V——, a month since, expectorated four ounces daily—now the expectoration has ceased. This result may partly be attributed to improvement of health under the use of appropriate regimen and the administration of cod-liver oil, but has probably been promoted by the inhalation of turpentine.

Profuse expectoration into a phthisical cavity is probably a cause as well as an indication of deteriorated blood, and measures which are consistent with a judicious regard to the accompanying conditions, may be advantageously employed in order to lessen its quantity. When the bronchial tubes contribute much to the supply, the skin being moist and the appetite defective, naphtha may sometimes be useful, but generally speaking, tannic acid will probably be found a more appropriate medicine.—*Lancet, August* 2, 1851, *p.* 99.

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## 33.—ON THE USE OF COD-LIVER OIL IN PHTHISIS.

By Dr. Theophilus Thompson, F.R.S., &c.

[Dr. Thompson makes the following remarks upon the virtues of the varieties of cod-liver oil. He says:]

You may wish to form an opinion regarding the comparative efficacy of the different kinds of cod-liver oil. In my early trials of the remedy, six years since, forty or fifty cases were treated with the coarse kind, resembling what is used in preparing leather, and the average benefit derived did not materially differ from that effected by the purest varieties subsequently employed. At a later period I had the curiosity to try these different kinds, combined with liquor potassæ and peppermint oil, giving alternately the coarse and the purified cod oil, and recording the report of the patients; and it is a curious fact that the majority actually gave the preference to the mixtures in which the coarser oil was introduced. Objections have been made to this combination as complicating the treatment with the addition of a medicine by some persons supposed to be inappropriate; but my experience is favourable to the use of liquor potassæ, especially in the early stage of phthisis, and theoretical arguments might be advanced in its favour. In scrofulous affections, if Dr. Hughes Bennett be correct in his hypothesis, there is probably undue acidity of stomach, unfavourable to the solution of albuminous materials. The alkali of the salivary and pancreatic fluids, being neutralized, fails to convert the carbon into oil. The lungs not having enough carbon to excrete, local congestions arise; the blood is overcharged with albumen, and the albuminous exudation being deficient in fat, elementary molecules are not formed so as to constitute nuclei capable of development into cells, and tubercular corpuscles are the natural result.

Cod-liver oil probably tends to obviate the series of derangements just described, by combining with the albuminous element of chyme, so as to form the healthy chyle-granules which feed the blood, and, for the reason above named, is probably better introduced in scrofulous subjects when combined with an alkali. It is a curious fact, that when, about seventy-five years since, cod-liver oil was largely used at the Manchester infirmary, chiefly in the treatment of rheumatism, the medicine was ordinarily given combined with alkali; Dr. Percival's favourite prescription being twelve minims of soap lixivium, an ounce of cod-liver oil, and half an ounce of peppermint water. The practice of administering a little lemon-juice afterwards would not necessarily interfere with the action of the alkali, and is worthy of incidental notice in connexion with the recent valuable suggestions of Dr. G. O. Rees in the treatment of rheumatism with the acid of lemons. Occasionally, although not frequently, the stomach rebels against the oil, however purified, and in whatever combination; and I have been accustomed in consequence, under such circumstances, to introduce the oil endermically.

Three years since I was requested to see a gentleman from the country, confined to his bed, emaciated, hectic, and apparently failing rapidly, with a cavity at the apex of the right lung. There was considerable diarrhœa; and thinking the internal use of cod oil unseasonable, I ordered an ounce, combined with oil of lavender, to be rubbed into the chest night and morning. This gentleman gradually rallied, and returned to the country, where he advanced much in strength and weight, and rode about on horseback. I examined him last year, and, judging from the physical signs, found the size of the cavity materially reduced.

J. S., a patient under my care for the last two years, with softened tubercle in the left lung, notwithstanding the adoption of a tonic regimen, and the internal administration of cod oil, got gradually worse, and in the four months preceding August 1850, her weight was reduced from 105 to 97 pounds. I then prescribed, as a liniment, three ounces of cod oil; an ounce of sal volatile; half a drachm of oil of lavender; five grains of opium; half to be rubbed in night and morning. In a fortnight improvement commenced, and in two months her weight had risen to 104 pounds.

M. A. W., a patient lately in the hospital with cavernous respiration at the summits of both lungs, and who had weekly lost, on an average, a pound in weight for twelve weeks, rallied, gained a little weight during the first month of using the same liniment, and left the hospital somewhat improved. But I will not multiply examples. It is enough to say that satisfactory results have been sufficiently frequent to authorize the measure, sometimes as an auxiliary to the internal use of the oil, but more especially as a substitute when the stomach revolts at its internal administration.

I am indebted to Dr. Glover, of Newcastle, for a reference to some observations of Dr. Klencke, of Braunschwig, confirmatory of the results just described. In a Memoir on the Therapeutical History of Cod-Oil, Dr. Klencke says,—"I shaved some young dogs, and rubbed them with cod-liver oil twice daily for three weeks. At the end of this period they were in as good condition as dogs to whom oil had been internally administered; their bile was found as rich in fat, and their chyle equally charged with corpuscles without nuclei." Klencke adds that similar changes were observed in the bile and chyle of a cat bathed twice a day for some time in the same remedy, and that some oil was discovered in the urine of the animal, proving its free absorption by the skin.

You will naturally ask me whether there are any disadvantages incident to the use of so valuable a remedy? and you may repeat questions I have occasionally heard: Does it often produce diarrhœa? Does it tend to increase hæmoptysis? As respects the latter question, it might be sufficient to mention that the average frequency of the occurrence of hæmoptysis, as recorded by Louis and other observers, was fully as great in phthisical cases before cod-liver oil was introduced as it has proved in those cases statistically reported at this hospital in which this remedy has been perseveringly used. When hæmoptysis is active, it is, indeed, easy to imagine that a remedy which increases the fulness of the pulse might aggravate the spitting of blood; under such circumstances the fish-oil should be discontinued, and the removal of blood by cupping may be desirable. When, however, as is frequently the case, the hæmorrhage is passive, means which tend to enrich the blood are calculated to lessen the hæmorrhagic tendency, and its occurrence is by no means an adequate reason for the suspension of the oil.

As respects diarrhœa, a malady which the remedy under consideration has been supposed occasionally to aggravate, my own impression is that no such influence is evinced unless a state of erethism of the mucous membrane is present, in which case measures should be used to obviate such condition prior to the administration of the oil. Many of the patients take the oil unmixed, or, when such combinations are appropriate, floated on nitro-muriatic acid mixture, or on lemon-juice. The addition of creasote occasionally makes the stomach more tolerant of the remedy.

An ounce and a half of cod-liver oil, four drops of creasote, two drachms of compound tragacanth powder, and four ounces and a half of aniseed water, form a suitable mixture, of which an ounce may be taken thrice daily.

Those who take the oil unmixed, may cover the taste by eating dried orange peel, or by introducing a little dinner salt into the mouth before and after the oil.

I believe the fact to be that this medicine has no direct influence on the intestinal action, but that by improving the general health it tends indirectly to restore a natural condition of the bowels, whilst it expands the pulse, lessens the expectoration, moderates the night perspirations, and in many instances supersedes the necessity for the use of any other remedy.

You will say the evidence adduced of the powers of cod-oil is strong, but that the remedy was formerly highly estimated and yet fell into disuse, and you may enquire whether it may not exhibit the fluctuations of fashion, and again sink into oblivion. The best way to secure for any remedy its proper place in therapeutics, is to determine its mode of action; and with this view I have from time to time endeavoured to obtain an analysis of the blood of patients who were in the course of improvement under its use: as an example let me show you the analysis of the blood of a phthisical man in the Le Blanc ward, who had gained fourteen pounds weight in three months, and had essentially improved under the cod-oil treatment.

Dr. Snow did me the favour to make the analysis. I place by the side, for comparison, the analysis of the blood of a healthy male, as given by Becquerel and Rodier:—

| Analysis of Blood of a Healthy Male. | | | Of a Phthisical man after three months' Treatment with Cod-oil. |
|---|---|---|---|
| Water ... ... ... | 779·0 | ... | 770·6 |
| Blood-globules ... ... | 141·1 | ... | 143·5 |
| Fibrine ... ... ... | 2·2 | ... | 4·0 |
| Albumen ...69·4 | 76·2 | ... | 81·5 |
| Extractive & Salts 6·8 | | | |
| Fatty matters ... ... | 1·6 | ... | 0·4 |

The interest of these analyses is increased by their harmony with the observations of Simon, who recorded an increase of blood corpuscles and diminution of fibrine under the use of cod-oil; and their importance becomes more obvious when they are viewed in reference to the facts stated by Andral and Gavarret, who having analysed the blood in twenty-one cases of phthisis, found their maximum of fibrine 5·9, their minimum 2·1, and that the amount of corpuscles approximated to the normal standard in only two instances, in which it was represented by 122·1 and 120·4. Frequently, indeed, the amount was below 100, and the decrease of corpuscles was almost always accompanied with a corresponding increase of fibrine. (Simon's "Animal Chemistry," vol. i., p. 181, Sydenham Soc. edit.)

You see that in the patient just referred to, the proportion of blood-corpuscles pretty closely corresponds with that characteristic of health, and Mr. Rodgers reports a similar result from the examination of the blood of some other patients to whom we have given the oil. As far as I am aware, however, chemical observations lead to the conclusion, that in phthisis deficient proportion of blood-corpuscles is the usual peculiarity. Struck with this circumstance, I took pains to collect, chiefly from Simon, analyses of the blood in different diseases, and I have placed before you averages of the proportion of blood-corpuscles and albumen in certain diseases, with a view to compare them with phthisis.

*Average Proportion of some Constituents of Blood.*

| | Albumen. | Corpuscles. |
|---|---|---|
| In health ... ... ... | 76 | 130 |
| Pneumonia ... ... ... | 80 | 122 |
| Phthisis ... ... ... | 100 | 78 |
| Rheumatism ... ... ... | 100 | 74 |
| Diabetes ... ... ... | 105 | 80 |
| Chlorosis ... ... ... | 72 | 56 |
| Bright's disease ... ... | 103 | 50 |
| Carcinoma ... ... ... | 45 | 55 |
| Erysipelas ... ... ... | — | 100 |

You will observe that there are two diseases which present a peculiar similarity to phthisis, in their proportions of albumen and of corpuscles. These are rheumatism and diabetes. Now it is a remarkable fact, that rheumatism is a malady for

the treatment of which cod-liver oil was first introduced into this country, and for which it has been so largely and successfully employed elsewhere. The variety of rheumatism in which it was most effectual is that in which the impoverished condition of blood is most likely to occur.

Dr. Percival, half a century since, (see Works Literary, Moral, and Medical, by Dr. Thomas Percival, vol. 4, p. 354), observes,—"Men and women advanced in years, whose fibres may be supposed to have acquired a degree of rigidity, find surprising effects from it (cod-oil). Some who have been cripples for many years, and not able to move from their seats, have after a few weeks' use of it been able to go with the assistance of a stick, and, by a longer continuance, have enjoyed the pleasing satisfaction of being restored to the natural use of their limbs, which for a long time before had been a burden to them. Two cases occurred lately in which the oil had an extraordinary effect, even on young persons, whose ages did not exceed ten years. Guaiacum, calomel, blisters, &c., were tried on both these patients, but with so little benefit that opiates were given merely to procure temporary relief. Their lower limbs seemed to be a burden to them, and they had such an appearance of distortion, that no hopes of relief could be well entertained. In compliance with the particular request of their parents, the cod-oil was given. The one obtained a perfect cure, the other nearly so; the latter having a little distortion in his back, is prevented the use of his legs. So general (adds Dr. Percival) has been the use of the oil with us, that we dispense fifty or sixty gallons annually; and the good effects of it are so well known amongst the poorer sort, that it is particularly requested by them for almost every lameness. Except bark, opium, and mercury, I believe no medicine in the materia medica is likely to be of more service, and I should wish for a more general use of it, in order to prove that the above account of its good effects is no exaggeration."

I am strongly impressed with the value of the remedy in diabetes. It is true that this disease involves an additional element, which is not easy to suppose amenable to such a remedy as fish-oils, but the benefit derived in many respects is often remarkable.

In the month of April, 1848, a patient came under my care who had been affected with diabetes for some months, and had taken creasote and other medicines with little advantage. At the time I first saw her the quantity of urine passed in twenty-four hours amounted to ten pints.

The following table will show the progress under the cod-liver oil treatment:—

| Dates. | Remedies. | Urine. | |
|---|---|---|---|
| | | Quantity. | Specific Gravity. |
| 1848 | | | |
| April 1 | Cod-oil, two drachms three times a day. | Ten pints. | |
| „ 13 | Ditto. | Six pints. | |
| „ 20 | Ditto. | Four pints. | 1·040 |
| „ 27 | Cod-oil, four times daily. | Six pints. | 1·042 |
| May 4 | „ five times daily. | Three pints. | 1·042 |
| „ 11 | Ditto. | Three pints. | 1·037 |
| „ 18 | Ditto. | Two pints and a quart. | 1·020 |

Subsequently this patient passed unavoidably into other care, and owing to a misunderstanding, did not resume the cod-liver oil, which had been from temporary causes intermitted. She took a variety of remedies, including sulphur, hydrochloric acid, opium, and alkalies. Drachm doses of carbonate of soda for a time acted favourably, but on the whole she retrograded. Her weight, which in June, 1848, was 107 pounds, had fallen, by December, 1849, to 88 pounds. Her appearance was haggard; and there was threatening of pulmonary disease. The cod-oil was resumed, and even then with temporary advantage, but she ultimately relapsed and sank.

The theory which I have now proposed in explanation of one mode of action of the oil is in harmony with the fact that its good effects are specially produced in women and children, for in them the relative proportion of corpuscles is stated by chemists to be small.

I may state that the remedy has afforded me most satisfactory results in neuralgia and sciatica, when associated with anæmia. Whenever arterial or venous murmurs indicate such a condition, a rapid improvement may be expected to follow the administration of the oil, even without the assistance of ferruginous medicines. In some disturbed manifestations of the nervous system which may appear more moral than physical, the presence of a weak, small pulse, has sometimes led me to give the oil, and with signal success. Do not think that I dwell on this subject from any love of fanciful hypothesis. When the light issuing from a certain number of facts seems to converge towards a particular point of explanation, it is useful to try the applicability of that explanation to analogous facts, and thus to entertain, I do not say to adopt, a theory—a sort of tentative theory, or "*prudens quæstio.*" If the theory prove universally applicable, we obtain a law; if the explanation be found correct, it is yet seldom fruitless: indeed the proof of its inadequacy serves to narrow the field of enquiry, and to increase the probability that the next step may be in the right direction towards the attainment of truth. Time is sometimes lost in the laborious accumulation of miscellaneous facts. Numerism is productive only by the amount of "*lumen siccum,*" intellectual intuition,—applied in the selection and appreciation of facts. There is an aristocracy in facts as well as races, and the mind should be taught to discern their prerogative dignity. "The naturalist who cannot or will not see that one fact is often worth a thousand, as including them all in itself, and that it first makes all the other facts—who has not the head to comprehend, the soul to reverence a central experiment or observation, (what the Greeks would perhaps have called a protophænomenon,) will never receive an auspicious answer from the oracle of Nature."

To apply these observations to our immediate subject, let me remark that changes produced on the blood by diseases or remedies may fairly be placed amongst cardinal facts. It can scarcely be doubted, that if a professor accomplished in chemistry were officially connected with every hospital, such facts might be so collected as to render the discoveries of this important science available, in a remarkable degree, for the advancement of practical medicine.

Should further observation confirm what has been suggested in this lecture regarding the influence of fish oils on the composition of the circulating fluid, we shall discover more than the reason of their usefulness in phthisis; we shall show that they have no exclusive adaptation to that disease, but that they may be given with equal promise in various diseases associated with analogous conditions of the blood: and thus we may come to establish a therapeutical law so widely applicable as to simplify our principles, extend our resources, and consolidate our system of practical medicine. Such a generalization would commend itself to my mind by its freedom from complication and obscurity; for I am sure you will agree with me as to the evidence afforded in the noblest triumphs of philosophy, that although shallowness and obscurity are continually associated, yet that the ocean of truth is clear as well as deep, and that in proportion as we approach the truth, we shall attain to simplicity.—*Lancet, Sept.* 13, 1851, *p.* 243.

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## 34.—ON CHLOROFORM IN PULMONARY CONSUMPTION.

By T. Spencer Wells, Esq., Surgeon, R.N.

[Mr. Wells relates the following case at the request of a recently deceased nobleman, who had suffered during the last eight months of his life from attacks of difficult breathing and spasmodic cough. Most of the favourite remedies were employed with no relief to the symptoms, indeed, in some cases, with positive harm. Mr. Wells proceeds:]

At Rome, in May, the violence of the cough was quite extraordinary, and the *fits of* difficult breathing resembled those of pure spasmodic asthma. I was called

to him in one of those fits just after having employed chloroform for another purpose. The thought then occurred simultaneously to his lady and to myself, to attempt, at any cost, to give some temporary relief. I accordingly threw a few drops of chloroform on a handkerchief and held it before his face. The most complete relief was afforded immediately. In a few seconds, he passed from a state of extreme suffering to one of perfect ease. Tolerably healthy respiratory murmur was heard in parts of the chest where loud cooing and whistling noises had been heard just before. From this time he could never be without chloroform in his room. He thought once or twice that it left a feeling of faintness, or increased weakness for some hours, and, at one time, slight coldness and want of circulation in the extremities followed it; but I am not at all sure that these were not mere coincidences. They led me, however, to use the chloroform in a diluted form, mixing it with from four to six parts of eau de cologne. About half a drachm of this mixture on a handkerchief quite sufficed to afford relief, and, as he did not take it at first more than three or four times a week, the quantity of chloroform inhaled was then very small; yet it always enabled him *immediately* to take a long, full, deep breath, and he described the sensation of relief as "most luxurious." Latterly, as advancing disease led to a more frequent necessity for its employment, I thought the spirit in the eau de cologne might affect his head. I therefore gave the chloroform pure. Afterwards the "dead feeling" in the limbs and increased weakness was never observed, although the quantity of chloroform inhaled was much greater. He never took it, however, in such a quantity as to produce anything like insensibility. He was always perfectly conscious, and knew the exact moment when the necessary relief was obtained. If he continued the inhalation longer, he felt himself becoming a little "light about the head," and sometimes spoke for a few moments in a confused manner; but I never observed, at any time, the least ill effect which could fairly be attributed to the chloroform. The pulse always became fuller and softer, but its rate was scarcely, if at all, affected.

During the last few days of his life, those well-known symptoms of ulceration of the trachea came on, which often render the termination of consumption so agonising both to the patient and his friends. They led to the more frequent and almost constant use of chloroform, but in the same small doses, and with the same happy results. The intellect remained perfectly clear until asphyxia was actually commencing, and he was most anxious that those suffering from his disease might find relief from the same remedy. He called it his "bottle life." He was well acquainted with the physiology of respiration and circulation, was continually analysing his own sensations, and he said he felt perfectly sure, not only that the chloroform relieved some spasmodic closure of the air-passages, and allowed air to enter his lungs, but that the vapour itself "ventilated his blood" more than common air would do. Its effect was always certain and immediate. We never had to *hope* that the remedy would be effectual; we were always *certain* that, whatever the degree of dyspnœa, however great the violence of the cough, so long as we had chloroform, the means of relief were at hand, and we were never once disappointed.

I do not wish to add any speculations to a narrative which I intend as a plain statement of facts, still less to deduce any general conclusions from one case; but I may add, that I have employed chloroform in two cases of spasmodic asthma with similar good effects, and that I have never been able to trace the least ill effect to its use. Even if it were proved to produce such injurious effects as opium and other narcotics, I submit that this would be no valid objection to its employment, for the daily general use of these drugs, the benefit of which is often very doubtful, shows that such ill effects are universally thought to be less than those likely to result from the unrelieved cough and dyspnœa. I had more than one proof during the progress of the case just related, of the truth of the general belief, when, owing to accidental circumstances, no chloroform could be procured for some time. It must be remembered, also, that the period during which phthisis was running its course was much more than double the average length.—*Med. Times, October* 11, 1851, *p.* 376.

## 35.—SPECIMEN OF LUNGS SHOWING THE ARREST OF PHTHISIS IN THE THIRD STAGE OF THE DISEASE.

By Dr. Quain.

[The following case was brought by Dr. Quain before the Pathological Society of London.]

A female, in May, 1848, when thirteen years of age, was admitted an out-patient at the Brompton Hospital. She was very delicate, had lost flesh, and was suffering from severe cough, shortness of breathing, &c. Her illness had commenced with influenza in the early part of the preceding winter; she had also suffered from an abscess in the right arm. She had been recommended cod-liver oil, but was unable to keep it on her stomach. There was no predisposition to phthisis, and she had not then had hæmoptysis. Since that time a younger sister has shown unequivocal evidence of phthisis, and an older sister has now become delicate. A note, taken shortly after her admission, states that "there is extensive consolidation at the apex of the left lung, and some deposition at the apex of the right," shown at the one side "by decided dullness, bronchial breathing, and bronchophony; and at the other side, by a feeble inspiratory, and a prolonged louder expiratory murmur."

A mixture, in which a drachm dose of cod-liver oil was diffused by means of liquor potassæ in mucilage, and a syrup composed of mucilage, syrup of squills, and a minute dose of morphia, was prescribed. The oil mixture was taken without disturbing the stomach, and she kept her ground. Examined in August she is stated to have lost four pounds in weight, and crepitation is heard over the left apex; nothing additional at the right apex. Iodine counter irritation was then applied. In the beginning of September she had profuse hæmoptysis, and subsequently a free puriform expectoration.

An examination, made in the course of this month, when she was able to attend the hospital, showed the existence of a large cavity, where the consolidation and softening had been previously observed. The dose of the oil was subsequently increased, first to a drachm and a half, and then to two drachms, with advantage; for in the end of the following December, it is recorded that "she gains strength, and coughs but little." She did not attend during this winter, but received her medicine by her mother, and did well. In April, 1849, she had an attack of influenza, from which she soon rallied.

In the following June the record is, that "she has not lost ground, though she had not gained in weight since her admission a year ago: there is loud pectoriloquy, cavernous breathing, and gurgling at the left apex, and loud expiratory murmur at the right."

At the end of July the report is "she looks well, coughs only in the morning." In August an examination showed "flattening of the chest over the apex of the left lung. The respiration there, though cavernous, is not loud. The pectoriloquy is very distinct. The respiration at the right apex is somewhat puerile." During the winter (1849-50) she continued the remedies.

In February her appetite had failed, and a mixture of infusion of gentian and bicarbonate of soda was ordered once a day. From this she derived so much benefit that it was continued three times daily, and she was able to take the simple aniseed oil in half-ounce doses.

The following June it is noticed that she has had an attack of nettle-rash, but is still gaining strength, grows tall, and coughs but little, and only in the morning.

This improvement continued; and it is noted that last October she came to the hospital, having been for some time in the country, looking extremely well. Her weight, which at one time had been as low as four stone two pounds, is now four stone nine pounds. She had scarcely any cough; her appetite is good. She is free from suffering of any kind. Examination of the chest shows remarkable flattening and contraction over the apex of the left lung. There is very evident dulness in this situation, and the mobility here is as 9 to 32 of the opposite side. The respiration is of a sharp whiffling character, with slight crepitus. At the opposite side the respiration is loudly puerile, and percussion shows the right lung extending across the sternum to the left side. At the summit of the left lung *posteriorly* the respiration is scarcely audible. The dulness here is more decided

than in front. The heart is seen and felt to beat distinctly from between the second to the fourth left costal cartilages. The action of the heart in this situation had been a source of some annoyance to her. From this time (October) to the commencement of last March, this improvement continued. Her cough had nearly if not altogether disappeared. She continued the gentian with soda, the cod-liver oil, and the counter irritant occasionally. At the beginning of March, during the prevalence of the influenza, she was attacked by the gastric, and not the pulmonary, complication of the disease. It commenced with bilious vomiting, followed by diarrhœa, great prostration and rapid collapse, from which she died on the fourth day.

The body was well proportioned, and showing a very fair amount of fat in the subcutaneous tissue. The right lung was seen to be very voluminous, and extending across nearly as far as the left margin of the sternum. There was no appearance of the left lung in front, but its place was occupied by the heart and pericardium drawn upwards and to the left side, and the walls of the apex of the chest falling inwards and downwards. The heart was healthy, and rather large for the size of the body. The left lung was found much diminished in size behind it. The lung was adherent more especially at the apex, which was covered posteriorly by a mass of solid fibrinous tissue, corresponding to the seat of dulness and feeble respiration previously mentioned. Very nearly the whole of what had been the upper lobe of this lung was occupied by the remains of a cavity irregularly divided into two by one of the bands so frequently seen in phthisical cavities. The entire cavity was about the size of a large walnut. It contained about half a drachm of a thin whey-like fluid, with which were mixed particles of whitish coagula. The walls were formed by condensed pulmonary tissue, varying in thickness from less than a line to a quarter of an inch, and in some points puckered and contracted. The air-cells and small bronchi were distinctly visible, under the microscope, in this tissue, which was separated from the contents of the cavity by a wall or membrane composed of firm filamentous tissue and granular cells. This membrane had much the appearance of a mucous membrane, but it was not examined sufficiently soon after death to be able to trace the presence of an epithelium. The cavity communicated with the left bronchus by an orifice which would admit a crow-quill, situated midway between the top and bottom of the cavity. There was a good deal of healthy respiratory tissue in the lower lobe of this lung; but there were scattered through its substance six or seven points of condensation, such as are hereafter described existing in the right lung. The right lung was large, and the air-cells partook of its character. In water it displaced a quantity which measured twenty-three ounces, whilst the left displaced but nine ounces. The apex was remarkably puckered; and on cutting through this puckering the tissue of the lung was found to be traversed by short fibrous bands, between which appeared points of softish yellow tubercle. A little lower down in the centre of the upper lobe a mass of soft tubercle, about the size of a small hazel-nut, was found. It was enclosed in a cyst, and consisted almost entirely of fatty granules and cells containing similar particles. In the other lobes several consolidated points were found—the largest smaller than last described, and none so fully formed. They appeared in some places to consist merely of condensed tissue; in two there was an appearance of yellow, firm tubercle, and in two, small calcareous particles. In neither lung was there the least appearance of recent tuberculous deposit. The other organs were healthy; the kidneys were large. There was no disease of the intestine beyond congestion, which in some parts was very distinct.

This case affords an additional illustration of the great extent to which the ravages of pulmonary phthisis may proceed, and its progress yet be stayed. Such cases were, happily, now met with more often since cod-liver oil had come into use: still Dr. Quain did not know of any case which afforded, by the evidence of post-mortem examination, so striking a result. This case was also interesting from its throwing light on the nature of the puckerings so constantly seen. Some observers were disposed to regard them as being independent of tuberculous deposit. In this case it was evident that they were due to the previous existence of this deposit, which, in fact, had been recognised there during life, and traced after death.—*Med. Gazette, June* 20, 1851, *p.* 1086.

## 36.—ON THE PATHOLOGICAL STATES OF THE LUNG CONNECTED WITH BRONCHITIS AND BRONCHIAL OBSTRUCTION.

By Dr. W. T. Gairdner, Pathologist to the Royal Infirmary of Edinburgh.

[In discussing the relation of bronchitic collapse to pulmonary emphysema Dr. Gairdner suggests that what he calls the deobstruent function of the bronchial tubes must be of the greatest physiological interest, reflecting that there is scarcely a fever, or other debilitating disease, in which the signs of mucous accumulation and of partial pulmonary collapse may not at one period or other be discovered at the lower and back part of the lungs. Dr. Gairdner also believes, that even in health the removal of the viscid secretion constantly formed in the tubes must form an element of the highest importance in their function. In some persons this removal seems to be ill-performed, though in greater quantity than natural; it is not discharged as rapidly as it is secreted, either the deobstruent apparatus being defective, or from the bronchial muscles being innervated. These persons are subject to the dry or humid asthma of English authors, and the catarrh sec. of Laennec, and they are liable to the supervention of organic disorder, usually a form of pulmonary emphysema, especially if care is not taken to guard against the occurrence of bronchitis.]

Not unfrequently a considerable, or even an extreme amount of pulmonary emphysema is observed to follow a single attack of acute disease in the chest. Thus emphysema frequently arises in the earliest years of infancy and childhood, as the consequence of some form of severe infantile bronchitis; and all practitioners can bear witness to many cases in which shortness of breath and incapacity for exertion can be traced distinctly back to the date of an attack of hooping-cough or measles. Some of the most marked instances of emphysematous lungs in young subjects that have fallen under my notice, in dissection, have had a similar history; and all authors on the diseases of children, who have carefully investigated the morbid anatomy and history of these affections, concur on this point. Again, in adults otherwise healthy, the severer forms of epidemic influenza are peculiarly apt to be attended with, or followed by, the development of emphysematous lesions; a fact which has been well observed and carefully recorded by Dr. Peacock, in his excellent history of the last London epidemic of that disease.

Finally, a certain amount of emphysema of the lungs is of so frequent occurrence in the aged, as to be scarcely entitled to the name of a disease, distinct from the other evidences of corporeal decay. This fact was first pointed out by Magendie, and the form of emphysema here alluded to has since been described by many pathologists as a peculiar one, constituting a kind of senile atrophy of the pulmonary tissue. But there can be little doubt, that here also the pulmonary lesion is the concomitant of a bronchial affection,—the chronic bronchitis or bronchorrœa,—which is the almost constant companion of the more advanced periods of human life. In cases where this has been absent, I have repeatedly found the lungs of very aged individuals free from all trace of emphysematous lesion.

Considerations like these have, ever since the accurate descriptions of emphysema by Laennec became generally known, given rise to a general belief among practitioners that emphysema is related to bronchitis as effect to cause; and that it is indeed the organic lesion of the lung of all others most closely and invariably connected with long-continued or severe bronchial affections.

*Mechanism of emphysema.*—Emphysema of the lungs was said by Laennec, in one of the most original and accurate of his descriptions, to have two varieties: the one being a dilatation of the air-cells, and finally a rupture of them one into another by removal of their septa; the other a rupture of the air-passages directly into the interlobular areolar tissue. It is needless to repeat these descriptions, the distinction of vesicular and interlobular emphysema being well known to every one, or at least accessible to all, in words which cannot be improved. It is only necessary to add, that the microscope and other modern means of investigation, which have done so much for morbid anatomy, have scarcely availed here to augment our knowledge; having only succeeded in demonstrating more clearly the fact, known to Laennec, of the gradual breaking up of the vesicular septa, and the obliteration of their capillary network.

Emphysema, therefore, is an abnormal distension of the pulmonary tissue with

air. In its earliest stages, whether interlobular or vesicular, or, as frequently happens, both combined, nothing can be more certain than that it is essentially a mechanical lesion: in fact, the distension of the air-cells, giving the peculiar cushion-like and pale appearance to the lung, can be exactly imitated by inflating it with undue force artificially. Moreover, the whole of the subsequent structural changes implied in the gradual removal of the septa and obliteration of the capillaries, are readily explained by the mechanical effects of distension. Upon this subject M. Poiseuille, to whom we owe so many interesting facts in mechanical physiology, has a very beautiful experiment.

An instrument being adapted to the pulmonary artery of an animal, by which a given quantity of liquid was propelled with a given force through the capillaries of the lung, he found that this was effected, in the normal condition, in 29 seconds. M. Poiseuille now inflated the lungs so as exactly to fill the cavity of the chest; the time was still 29 seconds. On distending the lungs, however, farther, so as to produce the appearance of a partial emphysema, the time required for the passage of the fluid became lengthened to 62 seconds; when the emphysematous appearance was increased, 95 seconds; when it pervaded the whole lung in consequence of excessive distension, 129 seconds were required, and the fluid returned from the pulmonary veins mixed with some bubbles of air. From these results, it is evident that whenever the air-cells are distended beyond the amount required or possible in the healthy condition, the flow of blood through the ultimate capillaries of the lung must be retarded or obstructed;—a condition not only corresponding with the appearances observed in emphysema, but readily accounting for the structural changes, the absorption of the walls of the air-cells, and the tension and obliteration of vessels observed in the latter stages of the disease.

It is, therefore, nearly certain that the source of emphysema is to be sought in a derangement of the mechanism of respiration, and not in any previously morbid condition of the affected part. Every thing denotes that the emphysematous parts of a lung are usually free from all diseased changes, with the exception of those which are the result of inordinate distension. The freedom from œdema and from morbid deposits, when other parts of the lung are so affected; the absence of accumulation in the bronchi, or at least its comparatively slight character, allowing of the perfect and easy inflation of the emphysematous parts when others are collapsed; finally, the habitual seat of emphysema in those parts of the lung which are usually most exempt from other disease,—all tend to prove what I have now stated. The diminished elasticity, the dryness, the anæmia, which have all of them been supposed to be the predisposing cause of this lesion, are manifestly nothing more than the effects of the distension with air upon the circulation and nutrition of the compressed walls of the delicate pulmonary air cells. Even the small accumulations of granular deposit found by Mr. Rainey may be accounted for by these secondary nutritive changes.

But emphysema is not merely a lesion resulting from inordinate distension of previously sound portions of lung; it is, as we have already seen, the product of mechanical derangement in the *sound parts* of lungs *otherwise diseased*. The existence of bronchitic condensation, of induration, of concretions, &c., if not a necessary cause of the production of emphysema in the sound air-vesicles, is at least in some way related to it.

[Some suppose, as Laennec, that emphysema is produced by violent efforts of coughing or other forcible expiratory acts; believing that it occurs in the act of expiration. But the expiratory act is mechanically incapable of producing distension of the lung, or any part of it, and it is singular that a theory so radically unsound, and devoid of proof, should have been allowed to maintain its place in medical science. Dr. Gairdner continues,]

It appears to me that none of the writers on this subject have clearly apprehended, or at least clearly expressed, the single obvious condition which is necessary to the mechanical completeness of the inspiration-theory of emphysema. Emphysema is, according to this theory, a *complementary* lesion, dependent upon the previous existence of some form of occlusion of the vesicles, and invading the remaining sound portions of lung. Thus far it corresponds with all that we have hitherto seen, to an extent certainly not anticipated by Dr. Williams, when, after enunciating his own view, he brings forward Laennec's theory to account for resi-

dual unexplained cases. But there is yet another condition necessary, besides mere occlusion of the air-vesicles in a part of the lung: this is *partially diminished bulk*;—in other words, collapse or permanent atrophy of a portion of the lung.

I am prepared to maintain, that emphysema of the lung may, in all cases which I have witnessed, be satisfactorily accounted for by considering it as *a secondary mechanical lesion, dependent on some condition of the respiratory apparatus leading to partially diminished bulk of the pulmonary tissue, and consequently disturbing the balance of air in inspiration.* I, therefore, submit this principle to the judgment of the profession, in the confident anticipation, that it will prove no less constant and satisfactory in the hands of other observers, and will establish itself as the exclusive law of the production of this most important lesion.—*Monthly Journal of Med. Science. July*, 1851, *p.* 2.

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37.—*Bleeding in Pneumonia.*—By Professor Bennett, (from his Clinical Reports.)—I have on a former occasion pointed out the rule which, it appears to me, should guide you with regard to bleeding in pneumonia. If you are called to a case at a very early period before exudation is poured out, and before dulness as its physical sign is characterized, but when, notwithstanding, there have been rigors, embarrassment of respiration, more or less pain in the side, and commencing crepitation, then bleeding will often cut the disease short. This state of matters is rarely seen in public hospitals. When on the other hand, there is perfect dulness over the lung, increased vocal resonance, and rusty sputum, then exudation blocks up the air-cells, and can only be got rid of by that exudation being transformed into pus, and excreted by the natural passages. In such a case, bleeding checks the vital powers necessary for these transformations, and as a general rule, if the disease be not fatal, will delay the recovery. I believe this to be the cause of so much mortality from pneumonia in hospitals where bleeding is largely practised, for in general, individuals affected do not enter until the third or fourth day, when the lung is already hepatized.—*Monthly Journal of Medical Science, August*, 1851, *p.* 159.

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## 38.—ON A CASE OF THYMIC ASTHMA.

By Dr. John Armstrong, Gravesend.

[On the 29th of January, 1851, Mrs. M., residing in London, was sent to Gravesend with her child, aged five months, for change of air. A short time afterwards, Dr. Armstrong was sent for, in consequence of the child being seized with something like a fit. Three weeks before the child was suddenly seized with great difficulty of breathing, while out of doors—becoming almost livid in his countenance, and seeming as if he would be strangled before he could get his breath; on the present occasion there had been some slight 'crowing.' A few weeks after the child had a similar attack, apparently brought on by cold.]

The child was attacked with symptoms of catarrh, which were slight, and were not considered to require medical attendance. After a few days (April 12th) he experienced another and more severe seizure than any former one, and I was sent for in great haste. The history given was the following:—The child became suddenly dark about his mouth, held his breath, his eyes seemed starting from their sockets, and his limbs became violently stretched. He appeared to recover his breath, began to cough, and when I arrived the attack had passed away. He looked frightened; his face pale and bathed in perspiration; pulse weak, intermitting, and quickened; skin cold. There was considerable fulness of the veins of the neck; the chest resonant throughout; sibilus and rhonchi heard over the left lung, and partly over the right; most distinctly heard on each side of the dorsal spine.

That night I was summoned to the little sufferer, who was stated to be dying. The attack was much the same: he had been sleeping, awoke up, become livid, convulsed, and apparently gasping for breath. I found him pale, with his head and face bathed in perspiration, with a feeble intermittent pulse, a loose frequent cough, troublesome at the termination of the attack. There had been no crowing

respiration. The attacks of dyspnœa now became frequent; he rarely went to sleep without an attack on awaking. They were now invariably accompanied with convulsions of an epileptic character. The countenance during the attack, lips especially, were quite livid, the tongue protruded, eyes turned in towards the nose, and nearly constant carpo-pedal contractions. The sides and centre of the lower part of the throat swollen, the jugular veins much distended; and the respiratory murmur was harsh or indistinct at the posterior part of the thorax. As each convulsive attack subsided, there was a peculiar, harsh, incessant, convulsive cough, by which small portions of frothy whitish phlegm were expelled from the trachea; and after some time about a teaspoonful or two was discharged, and the child seemed relieved. The difficulty of swallowing, especially of semi-fluid substances, continued, appearing always to excite coughing. Nothing gave relief; he continued to get worse, and died after an attack on April 24th, about a fortnight after the catarrhal seizure.

*Post-mortem examination sixteen hours after death.*—In the examination of the body, the chest chiefly attracted attention. There was a large thymus gland, extending from the thyroid gland to the pericardium, and laterally filling the space between the trachea, clavicle, and first rib. It was dense, firm, lobulated, of a fleshy colour; contained no fluid; it was upwards of an ounce in weight; its greatest density and development appeared on the left side; the large veins appeared almost flattened by the pressure; the par vagum and recurrent were pushed aside from their usual course, and must have been much pressed. The heart was of ordinary size, nearly empty. The foramen ovale closed. Internally the larynx and trachea were pale, except at the part where the thymus pressed, which was reddened; the remainder was natural; and without inflammatory appearances. The lungs, anteriorly, were natural; posteriorly, extensively carnified. Abdominal viscera healthy. The head was not examined.

*Remarks.*—This is the second case of this form of "laryngismus stridulus" which has occurred in my practice after a tolerably extensive acquaintance with infantile diseases for twenty years. The other was so similar in the essential characters both of the symptoms and post-mortem appearances, that after the above lengthy detail, I feel it is unnecessary to give them.

It is obvious that I do not class the ordinary cases of laryngismus stridulus, as Good has termed it, with the form under consideration. I have generally to treat cases of that form every year, which have been sent from London for change of air (for I may, in passing, observe, that among the children of this healthy locality, the disease is almost unknown). The London children soon recover under the influence of fresh air, and such treatment as the case indicates. But the variety which Kopp has called thymic asthma, is a much more formidable affair. I am aware that there is great difference of opinion respecting the disease, some even denying that the enlarged thymus is the cause of such alarming symptoms, but the careful, truthful observations of so many persons must carry conviction to unprejudiced minds.

To Mr. Hood of Kilmarnock, we are indebted for the first clear account of this formidable complaint, although Hassé, in his 'Pathological Anatomy,' says, "That Kopp first attempted to connect this preternatural enlargement of the thymus gland, and its pressure on the trachea, with an alarming ailment peculiar to childhood, which he accordingly termed thymic asthma." One cannot help feeling surprised at this error, as Hassé is obviously pretty well acquainted with English medical literature, and Kopp himself, in his Essay, adverts to Hood's paper. In addition to the papers and cases by these gentlemen, we have some by Drs. Copland, Montgomery, and West. This latter gentleman has observed one case, narrated in his very admirable "Lectures on the Diseases of Children," and which corresponds very exactly with the two cases observed by myself.

The conclusion is unavoidable, that though this form of the disease is very rare, yet that a most formidable and fatal disease is occasionally met with, dependent on enlarged thymus gland. That many of the symptoms exist in common with the ordinary forms of "laryngismus" is unquestionable, and therefore laryngismus stridulus must be considered as a generic term including several species. And, no doubt, by looking at the subject in this light, the discrepant opinions on this disease can be reconciled.

The disease presents itself under three forms:—

First. It occurs as a consequence of teething, intestinal irritation, worms, eruptions about the head, or it may be of a nervous or spasmodic character; and by suitable treatment—especially change of air—is generally cured. Mr. Robertson of Manchester, in the 'Medical Gazette, vol. viii.,' new series, has very clearly shown the benefit of change of air, and I fully agree with him; but we must not be misled by supposing that change of air is all that is requisite; so long as there are sources of irritation, the disease will probably go on till they are removed. I have been frequently consulted under such circumstances, and cases which had come here for change of air remained "in statu quo;" but as soon as the disordered function was rectified, the disease began to subside, and finally ceased. I could enumerate many cases of that description.

Second. The next class of cases are those which the late Dr. Hugh Ley so admirably portrayed; but although he threw much light on the subject, yet his views, it must be admitted, were too limited. He attributed these affections to enlarged bronchial and thyroid glands. Doubtless there are cases of this description—and bad cases they generally are—but I believe they do not occur so frequently as Dr. Ley supposed. Change of air, a healthy nurse, or suitable diet, close attention to the gums and bowels, and the administration of syrup of iodide of iron, will constitute the chief remedies.

Third. The last, most rare, and as I believe, the most formidable class, are those which have formed the subject of this paper, and the treatment of which is by no means settled. The first case I had was seen by my partner, the late Mr. Park, of this town, and he took the views entertained by Dr. John Clark as to the treatment. Accordingly, leeches and blisters were applied to the head, and mercury was given freely; but the post-mortem examination gave no signs of head disease, and nought save the hardened, enlarged thymus was discovered to explain the distressing symptoms. Mrs. M——'s child was treated by constant attention to the gums and bowels, leeches and blisters in the region of the thymus, mercury and anti-spasmodics, but with scarcely any relief. My impression is, that occasional leeching on the upper part of the chest, with the application of iodine externally and internally; strict attention to every source of irritation, with a view to its immediate removal; *causing the child to lie with its head well raised during sleep:* a healthy atmosphere, and light food, will constitute the treatment most likely to prove beneficial.

But although I cannot point out any infallible mode of treatment, a few words on diagnosis may prove benficial.

Dr. Copland, in his 'Dictionary,' says truly, "The diagnosis of enlarged thymus gland is a matter of importance, but of difficulty," and has ably pointed out the leading distinguishing features.

Those upon which I would place most reliance are, the sex of the child (males constitute by far the majority of those already reported); the pale, white, soft countenance; the permanent fulness about the upper part of the sternum, extending upwards nearly to the thyroidal region; an almost constant fulness of the veins of the neck, particularly after any effort, and very strongly evident for some time after an attack of dyspnœa; dulness on percussion over that part of the sternum; signs of congestion of the lungs, and from an early period difficulty of swallowing; the crowing sound is either entirely absent or very partial; the pulse is weak and intermittent; and there are copious perspirations over the head. These constitute a group of signs which enable me to determine my case most clearly, and I have no doubt will afford unerring guidance to those who have never met the disease, in arriving at a correct diagnosis when any such arise in their practice.—*Lancet, July* 12, 1851, *p.* 28.

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## 39.—ON THE CIRCUMSTANCES MODIFYING THE AMOUNT OF OXYGEN GAS CONSUMED AND CARBONIC ACID GAS EVOLVED IN THE FUNCTION OF RESPIRATION.

By Dr. William Prout, F.R.S., &c.

[By a series of many hundred experiments upon himself, Dr. Prout has established the two following laws.]

Law I. The amount of oxygen gas consumed, and, consequently, of carbonic acid formed during respiration, is not uniformly the same during the twenty-four hours, but is always greater at one and the same part of the day than at any other; that is to say, its maximum occurs between the hours of 10 a.m. and 2 p.m., or generally between 11 a.m. and 1 p.m.; and its minimum commences about 8 h. 30 m., p.m., and continues nearly uniform till about 3 h. 30 m., a.m.

Law II. Whenever the quantity of oxygen gas consumed, and consequently of carbonic acid gas formed, has been by any cause increased or raised above the natural standard of the period, it is subsequently as much decreased or depressed below that standard, and *vice versa*.

The first law is subject to some variations, but Dr. Prout never observed that it was liable to any exception. In all his experiments it was constantly observed that a greater quantity of carbonic acid gas was given off in the middle of the day than at any other period of the nycthemeral space. In general the degree and order of these variations are the following.

The quantity of carbonic acid gas which remains stationary at 3·30 per cent., the minimum during the night, begins about 3·30 a.m., suddenly to increase, at first slowly, afterwards more rapidly till about noon, when it is usually as high as 4·10 per cent., its maximum. After this time it begins to sink, at first quickly, then more slowly, till about 8·30 p.m., when it again attains the minimum rate, 3·30.

From the peculiar order and time at which these oscillations take place, Dr. Prout offers the conjecture, that these variations may depend on the presence and absence of the sun. He admits, however, that the question must be decided by subsequent observations. All that can be said is, that certainly the presence of the sun and solar light have very great influence upon the functions both of plants and of animals; and it is quite in accordance with many observations to think, that the decarbonizing power of the lungs may be most energetic while the sun is above the horizon, and the influence of light and heat is greatest.

Dr. Prout further found that the first law was liable to variations.

1st. In the quantity of carbonic acid gas as given off by the same individual in different days; and

2d. In its quantity, as given off by different individuals.

As to the first, Dr. Prout observed the variations several times; and was led to infer that when the increase is considerable it depends upon an electrical state of the atmosphere. Depressions or diminutions, he occasionally traced to abstinence in the use of food.

As to the second form of variation he found that the quantity of oxygen gas consumed, and consequently of carbonic acid gas, formed in a given time, by different individuals is very different. The lowest is that by himself or 3·45 cubic inches; the next is the estimate by Sir Humphrey Davy, from 3·5 to 4·5 cubic inches; and the next is by a friend of Dr. Prout, under precisely the same circumstances, and about the same age, namely, thirty years, both being of regular habits and in perfect health.

The circumstances under which the quantity of carbonic acid gas is increased appear to be comparatively few. Those under which it is diminished are very numerous, and the effects of the latter are both greater and more permanent.

Exercise, if not long continued and carried to fatigue, increases the amount. When long continued so as to fatigue, the amount is diminished. The same effect is produced under the operation of the exhilarating passions.

As to food, long abstinence diminishes the quantity of carbonic acid gas eliminated; yet not to so great a degree as might be expected.

The following observations on the effects of the use of spirituous and fermented liquors are important in showing how these agents impede the proper functions of the lungs in eliminating carbonaceous matter from the system. Alcohol and all liquors containing it which were tried, diminished the amount eliminated, much more than any other article or circumstance subjected to experiment. Under the use of porter, even the amount diminished is reduced below the standard; while the reverse was the case when water only is taken. The experiments made on this subject furnished results which fully convinced Dr. Prout, that the use of alcohol in every state and in every quantity uniformly lessens in a greater or less degree the quantity of carbonic acid gas eliminated, according to the quantity and

the circumstances under which it is taken. When alcohol, either pure or diluted, is taken upon an empty stomach its effects are remarkable. These effects appear to take place almost instantaneously; and the depression in the amount of carbonic acid gas extricated is the greatest. After a short time, however, the powers of the constitution appear to rally, and the quantity emitted is rapidly increased; then it again sinks, and afterwards slowly rises to the standard. This same species of oscillation Dr. Prout generally observed when the quantity has been suddenly and greatly raised or depressed from any cause; and he thought it might arise from the circumstance, that the animal powers are required to counteract the effects of a poison or other noxious agent, which might then stimulate them to overact their natural capabilities.

When vinous liquors are taken upon a full stomach, as after dinner, their effects are more slow, but not less sure and remarkable. Dr. Prout thought them even more permanent; but this, he admits, might arise from their having been taken in larger quantity, than he chose to do when the stomach was empty. As long as their effects are perceptible, so long is the quantity of carbonic acid emitted below the standard. With the experimenter himself these effects used to go off with frequent yawnings, and with a sensation as if he had just awaked from sleep. Under these circumstances he found the quantity generally much above the standard, and hence he thought it probable that the system was then freeing itself from the retained carbon.

It thus appears that vinous and spirituous liquors, which are generally accounted stimulants, though they may stimulate under certain circumstances and in certain doses the mucous surface of the stomach and alimentary canal, and even the interior of the blood-vessels into which they are received, act nevertheless as powerful sedatives, by preventing the elimination and causing the retention of carbonaceous matter, which in the normal and natural state ought to be eliminated. This circumstance further accounts for the loss of heat which invariably follows the administration and use of these liquors.

It is further a curious and important observation that very similar to the effects of alcohol are those of strong tea, whether warm or cold.

The depressing passions, as anxiety, grief, solicitude, uncertainty, in short, whatever produces that peculiar sensation which induces yawning, sighing, or any other deep inspiration, have evidently the effect of diminishing the quantity eliminated; these appearing, indeed, to be so many involuntary acts, by which the system endeavours to get rid of the retained carbon.

At the close of the essay Dr. Prout makes the following general observations on the particular organic system through which these effects may be supposed to take place, and also the influence of solar light.

"Of the causes operating to produce the above variations, no doubt the state of the circulation is to be considered as one. It is impossible but to suppose that when, *cæteris paribus*, a greater quantity of blood is exposed in a given time to the action of the air, that a greater quantity of carbonic acid gas must be formed, supposing this, at least, to be a common chemical process. It must, I think, be admitted, therefore, that this cause contributes in some degree to the production of the phenomena in question, though, there is every reason to believe, in a very limited one. A very superficial examination of the above experiments will show that the quantity of carbonic acid gas formed bears scarcely any proportion to the numerical state, at least, of the pulse. This, indeed, I admit to be a very imperfect criterion of the quantity of blood circulating through a part in a given time, unless its strength and degree of fulness be taken into the account; but it might be asked, has the pulse been noticed to be uniformly stronger and fuller in the middle of the day than at any other time? and is it not constantly so under the operation of hard exercise and the influence of wine?

"Mr. Brodie, in his excellent dissertations on the effects of poisons, has apparently demonstrated that respiration is altogether dependent on the brain; since, when the operations of this organ were destroyed or cut off, it almost immediately ceased; while the heart, which he found much less under nervous influence, continued for some time to act, and circulated dark coloured blood. He found also that alcohol, the essential oil of bitter almonds, and some other poisons, act as such simply by destroying the functions of the brain apparently by sympathy,

and not by absorption; and that under the operation of these, respiration soon begins to be ill performed, and if their quantity has been great, at last entirely ceases. This then, while it enables us to account for the effects of alcohol in our experiments, seems also at the same time to prove, in general, that another cause besides the mere state of circulation is immediately and largely concerned in the production of the phenomena in question. I conclude, therefore, that the *nervous system*, acting partly through the medium of the blood, and immediately by its influence over the function of respiration, is the grand source to which we must refer them all.

"The laws which we have attempted to establish are no other than modifications of that general principle which prevails over all living actions. A state of depression ever follows a state of excitement; and the greater that excitement has been the greater is the consequent depression. On the other hand, an uniformity of action at any point of the scale within which it ranges is no less incompatible with life than a great and sudden deviation towards either extreme. In all living actions, therefore, states of comparative rest alternate with states of exertion; and these alternations are evidently connected with the presence or absence of the sun; for according as this 'great source of life and heat' is present or absent, are organized beings, in general, either awake and active, or asleep and inactive. Now at noon this powerful agent of nature is at its height, and hence at this time may be supposed to exert his maximum energy; whatever, therefore, is under his immediate influence, must now be supposed to be affected most strongly; and if the hypothesis be correct, that nervous action is so, it is perhaps easy to account for many important phenomena which it presents, and, among others, that of the greater elicitation of carbonic acid at noon, respiration being considered as under its immediate influence."

[Dr. Prout afterwards published some supplementary observations on this subject.]

He had mentioned in his first paper, that he was much struck with the sudden increase in the amount of carbonic acid eliminated from the lungs in the morning about the commencement of twilight. To determine whether this increase was accidental, or really was subject to the movements of the sun, he commenced a series of experiments about the winter solstice, and continued them till nearly the time of the summer solstice, the period thus including all the variations on the time of the sun's rising. The result of these experiments was, that the increase always uniformly occurred soon after the commencement of twilight and before sunrise, and the increase was greatest and most remarkable when the nights were longest, and that it gradually became less as the nights grew shorter. He allows that this may have been chiefly owing to a diminution having taken place in the usual minimum quantity towards morning, either probably from the fatigue of watching or from drowsiness.

The time of the evening diminution appears to be about the termination of twilight and the commencement of darkness. Dr. Prout infers, from various facts, that Law I., given in the first paper, requires to be modified, and instead of the periods there mentioned, 8 h. 30 m., p.m., and 3 h. 30 m., a.m., as the commencement and termination of the minimum, he substitutes the words, the ending and beginning of twilight.

In the second division of the investigation, the object of which was to determine the respective influence of modes of diet, and various alimentary, medicinal, and other physical agents, Dr. Prout found his former inferences very generally corroborated by the experiments of Dr. Andrew Fyfe, which had been made known in the interval subsequent to the first experiments of Dr. Prout.

Dr. Fyfe fixed the standard quantity of carbonic acid gas emitted from his own lungs under ordinary circumstances of health at about 8·5 per cent.

1. He found that, under the use of vegetable diet, this was reduced to about 4·5 per cent. Dr. Prout found, that on the seventh and eighth days of vegetable diet, the same amount of reduction took place.

2. The effects of animal diet, Dr. Fyfe found to be various. Dr. Prout found, that on the fourth day of diet with animal matters, the quantity of carbonic acid was 7 per cent., on the seventh and eighth days, 5 per cent.

3. Under the use of wine, Dr. Fyfe found the quantity of carbonic acid reduced

to between 2 and 3 per cent., and in one experiment, to only 5·75 per cent. The experiments of Dr. Fyfe were not made till the day after the use of wine. Those of Dr. Prout were made immediately, and whilst the first effects were present.

4. Under the use of mercury, Dr. Fyfe observed a reduction to about 3 per cent. Dr. Prout observed a considerable diminution, varying from 2·80 per cent to 4·5. The diminution, nevertheless, though perfectly real, was not often so great as that observed by Dr. Fyfe.

5. Under the use of nitric acid, Dr. Fyfe observed a reduction of between 6 and 7 per cent. Dr. Prout appears not to have made trial of the effects of this acid.

The paper is concluded by the following general observations, which must be studied in forming any estimate of the accuracy of these experiments.

"With respect to the numbers here brought forward, as well as those in my former paper, I wish it to be distinctly understood that they do not represent the measures of the quantity of carbonic acid emitted *in* any given time from the lungs but the measures of the power or capability of the lungs *at* any given time, to form or throw off carbonic acid. This was not so distinctly pointed out in my former communication as it ought to have been. What I mean, then, to say is this, that the *power* or *capability* of the lungs for forming and throwing off carbonic acid is *greater* at noon, &c.; and not that a greater quantity of it *is actually thrown off* at that time than at any other. A greater quantity will indeed be thrown off, *cæteris paribus*, on an equal number of similar respirations being made in the same given time. But whether this be really the case or not, I cannot pretend to determine.

"If the hypothesis which was fairly advanced be founded in truth, it is evident that we have in these numbers a sort of relative measure of the degree of energy of the nervous system; but whether it be a measure of the energy of this system as it operates through the medium of the blood, or the muscular apparatus of circulation or respiration, or partly on all the three, I am unable to decide; that is to say, I do not precisely know whether the changes under consideration are to be ascribed to differences in the state of the blood itself, or to differences in the state of circulation or respiration. Perhaps all these causes may contribute in some degree to produce them.

"It is true that Dr. Fyfe did not observe at all these diurnal variations. But this has little or no weight, when the apparatus he employed is considered; since it was incapable of showing it, or at least the variations would be so extremely small that they would most likely escape observation. For my own part, I do not consider either my own experiments or his entirely conclusive on any one point. This is a thing that can hardly be settled by one or two observers. Indeed nothing but the striking uniformity that has occurred to me, and the little probability at present of my being able to repeat them in a less exceptionable manner, added to my wish of correcting as above what I formerly advanced, would have induced me to submit these observations to the world. Hence I content myself with little more than stating matters as I have found them, still waiving all speculations, however interesting they may be, till the matter has been thoroughly investigated, or at least much better examined into, either by myself or others."—*Edinburgh Med. and Surg. Journal, July*, 1851, *p.* 129.

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## 40.—ON ANGINA PECTORIS.

By James Kirk, Esq., Glasgow.

*Definition.*—Neuralgia of the branches of the par vagum, going to the heart and lungs; embarrassing the functions of these organs, and spreading by nervous connection to other parts; sometimes accompanied by organic lesion of the heart or great vessels, sometimes not.

*Causes.*—Predisposing; the middle age, the male sex, an indolent, luxurious, studious, or sedentary life; gout, rheumatism, or neuralgia; or worse than these, the long-continued anxiety of mind and fatigue of body, to which persons of high mind and narrow circumstances are, in the present state of society, so constantly exposed.

*Causes.*—Exciting, running, walking, especially up hill or up stairs, great bodily

exertion or mental excitement, and rapid changes of temperature: thus we most frequently see a severe attack after great exertion, a fit of passion, or on the evening of a cold wet day. As the disease increases in severity it will be found that slighter causes are sufficient to produce an attack; and that any one of them will occasion a seizure much more certainly after a meal. Finally, when the disease has become chronic, it may even attack the patient in his sleep.

*Symptoms.*—In the acute form of the disease the patient is suddenly seized with a sharp, darting, lancinating, or stabbing pain under the left breast, frequently spreading to the throat, arm, back, and leg of the same side; this pain frequently amounts to the most excruciating agony, and has been compared by Laennec to the piercing with nails or the laceration by the claws of animals; and is accompanied by a sense of suffocation, great difficulty of breathing, tendency to syncope, and flatulent distension of the stomach followed by eructations; together with the fear and the feeling of immediate death.

The pulse varies in different individuals; sometimes it is regular, sometimes irregular, sometimes weak, sometimes strong; but generally feeble and slow. After lasting for a longer or shorter time, proportioned to the severity and duration of the disease, the attack generally passes off spontaneously, or yields to the remedies employed.

A feeling of weakness and numbness sometimes remains for a little time in the parts previously affected with pain; but with this exception the patient may enjoy tolerable health, and show no sign of disease until again exposed to some of the exciting causes.

In the chronic form of the disease the attacks are often preceded by yawning and weariness; they are now more readily excited; the interval between them also is shortened, and the relief obtained afterwards more imperfect; the pain commonly lasting longer, but being less violent. In addition likewise to the anginous paroxysm the patient generally suffers from some other allied disorder of the nervous, digestive, or circulatory system, which may have been either a cause or a consequence of his malady; tic, dyspepsia, constipation, diarrhœa, (leucorrhœa if the patient is a female,) œdema, dropsy, or organic disease of the heart, may also be present to increase his suffering and diminish his hopes of recovery.

*Diagnosis.*—The only disease which bears any resemblance to angina is asthma; but the sharp pain in the breast and arm, and the sense of suffocation characteristic of angina, can hardly be mistaken for the dyspnœa, cough, and expectoration of asthma.

*Prognosis.*—Angina is a disease not necessarily fatal when occurring in young subjects with no organic disease of the heart; but when it occurs in elderly people with organic diseases of the heart or great vessels it is always mortal. In such cases, indeed, the organic lesion may be quite sufficient to account for the death of the patient, independent of the angina.

*Pathology.*—In the great majority of cases in which an inspection has been obtained after death, the heart or large vessels have been found diseased; but their pathological condition has been by no means constant or uniform. In some cases organic disease of the heart, the aorta, or the coronary arteries, have been found; in others ossification of the coronary arteries, ossification of the valves, ossification or dilatation of the aorta, or preternatural softness of the heart, have been discovered, after death. Indeed, in the words of Dr. Unwins, "there is scarcely any malformation of the heart or its blood-vessels that has not been occasionally found after death, from what would be considered angina pectoris; while on the other hand, individuals have fallen victims to the affection, fully marked, and the most accurate post-mortem examination has not been able to detect the slightest indication of structural derangement." In other cases again, according to Dr. Copland, the only morbid appearances have been found in distant organs; the heart and large vessels remaining sound. These appearances were "adhesions of the pleura; effusion into the pleura; thickening of the bronchial mucous membrane; dilatation of the bronchi; œdema of the lungs; abscess in the mediastinum; ossification of the cartilages and the ribs; enlargement of the liver, and scirrhus of the pylorus."

But, on consideration, it will be obvious that we must look to some other cause than the organic lesions just mentioned for an explanation of the terrible agony

endured in this disease; seeing that singly and by themselves they do not account for it.

For, in the first place, these lesions are of very frequent occurrence, while angina is a rare disease; 2dly, these lesions are for the most part permanent conditions of the parts in which they occur, while this disease is intermittent; 3dly, these lesions may be present and the disease absent, or conversely, the disease may be present and the lesions all wanting; while in none of them does the patient endure the same amount of suffering as in angina; 4thly, we have seen a case in which tic preceded angina, or, in other words, the patient had neuralgia of the branches of the fifth pair going to the face, before those of the eighth (going to the heart) were affected by the same disease. These, and other reasons that might be mentioned, serve to show that something more than organic lesion is required to constitute the disease under consideration, and to confirm the opinion of Jurine, Desportes, Laennec, Chapman, and Copland, that it is a species of neuralgia of the pulmonary and cardiac nerves, affecting the functions of the heart and respiratory organs, and extending by nervous connection to other parts; the organic lesions found in fatal cases being either coincidences or effects of the disease.

*Treatment in the attack.*—If the pulse is full and strong, and the patient stout and plethoric, bleeding from the arm should be practised; but if the patient is weak and debilitated, and the pulse feeble and slow, it should be altogether avoided. And instead of bleeding, a flannel wrung out of hot water and sprinkled with turpentine should be placed over the region of the heart; the feet put in hot water containing mustard, and sixty drops of laudanum given immediately in a glass of any strong spirit: if relief is not speedily obtained this dose may be repeated with perfect safety; and sometimes acts like a charm in relieving the pain. This should be followed by the exhibition of some antispasmodic and carminative, such as ether, aromatic spirit of ammonia, or ammoniated tincture of valerian in cinnamon or mint water, in order to assist the stomach to expel the gas which distends it; these should also be given after bleeding in those cases in which it is practised, for when greatly distended, as it commonly is in this disease, the stomach pushes up the left side of the diaphragm; this diminishes the capacity of the chest, and so impedes the movements of the heart. It is not to be supposed, however, that the distension of the stomach is the cause of the pain in the breast; for the pain at the heart is felt before the distension of the stomach is complained of.

*Treatment in the interval.*—In the first place it will be absolutely necessary to discover by the most careful examination what are the predisposing and exciting causes of the disease, in order to avoid them if possible, as well as to determine the actual condition of the heart and lungs by means of the stethoscope.

For example, attention should be paid to the patient's habits and manner of living; the state of the stomach, bowels, liver, (and uterus if a female;) the condition of plethora or anæmia, and the predisposition to gout, rheumatism, or neuralgia: in short, every appreciable disorder of the system is to be met by the appropriate remedies, and corrected as far as possible. If the stethoscope should enable us to discover any abnormal condition of the heart, the treatment must have a special reference to that condition: of course, where there is serious organic disease of the heart, a cure is not to be looked for; here the utmost we can do is to palliate the urgent symptoms. The remedies which have been found most useful are leeching, or cupping and counter-irritation over the region of the heart by means of croton-oil liniment, tartar emetic ointment, repeated blisters or issues, with low diet in the cases of stout plethoric individuals. With weakly debilitated subjects an opposite plan of treatment ought to be followed; tonics, such as bark and steel, should be exhibited with nourishment and cordials. Various other medicines have been recommended in angina; the preparations of iron, sulphate of zinc, nitrate of silver, arsenical solution, sulphate of quinine, mercurials, and colchicum, may all be prescribed with advantage according to the various indications afforded by the history of each individual case.

In addition to the above, we may mention that Laennec recommended magnetism, and Kneeland electricity; and that Heberden gave an opiate at bed-time when the attacks occurred during the night. Moreover, cases of every variety of complication will be much benefited by pure air and gentle exercise, together with an

entire change of all the habits and circumstances prejudicial to the patient's well-being, in which the disease had its origin.—*Med. Gazette, August* 29, 1851, *p.* 382.

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## 41.—LARYNGITIS—TREATMENT BY TOPICAL APPLICATIONS.

By Professor Bennett.

[A patient, Alexander Flint, a salesman, aged 27, was admitted into the Royal Infirmary, Edinburgh, on Feb. 17th, 1851, suffering from extensive lupus of the face, diarrhœa, Bright's disease, and scrofulous caries of the left knee-joint. Under treatment the diarrhœa ceased, the lupus was cured, and the disease of the kidney alleviated; but on the 24th of May, symptoms of laryngitis came on.]

On the 30th June, notwithstanding the assiduous use of astringent gargles, occasional sponging of the fauces with solution of nitrate of silver, and the application of leeches, he was evidently worse, and he could only speak in a whisper. *July 6th.*—To-day, Dr. Horace Green of New York, who went round the wards with Dr. Bennett, stated that this was a remarkably good example of what he had named follicular disease, affecting the larynx. He passed the sponge, saturated with a solution of nitrate of silver (℥ij. to ℥i. of water), through the larynx into the trachea. The patient could not take a breath for some seconds afterwards, and described the sensation as like that produced by a piece of food "passing down the wrong way, and causing choking." The immediate effect of the operation was decided improvement of the voice, and more ease in deglutition. From this time his symptoms gradually left him. On the tenth, the sponge was again passed into the larynx by Dr. Bennett, and produced the same sense of temporary suffocation; but immediately afterwards he spoke with perfect clearness of voice. The application was made every second day until the 16th, when all the laryngeal symptoms had disappeared, the voice was normal, and there was no cough, expectoration, pain, or difficulty of deglutition. He now left the house: the disease in the joint had made considerable progress, but the renal disorder was much alleviated.

*Case* 2.—Helen Guthrie, æt. 25, married, a fisherwoman, admitted into the Clinical Ward, July 4th, 1851. Four months ago was seized with a cough, attended with hoarseness of the voice, dryness of the throat, painful deglutition, and pain in the larynx, which symptoms have continued with greater or less intensity up to the period of admission. Latterly, there has been considerable expectoration of purulent matter, often tinged with blood. On admission she complains of cough coming on in paroxysms, dryness in the throat, and pain in the larynx, voice cracked and occasionally absent. There is no difficulty in swallowing, but copious expectoration of frothy mucus. Can inspire without difficulty. Percussion over chest elicits nothing abnormal. On auscultation, the inspiratory murmur is harsh over superior third of chest on both sides. Over larynx and trachea there is heard a dry snoring sound. On examining the fauces, red patches were observable here and there, with slight erosion on the left side. The fauces and epiglottis were sponged with a solution of nitrate of silver (℥j. to ℥j. of water). This was repeated on the following day, and the voice was evidently improved. On the 6th, the sponge, saturated with the solution, was passed into the larynx by Dr. Horace Green, of New York, and produced no feeling of suffocation whatever. It was passed afterwards every day by Dr. Bennett till the 14th, when she left the house, all the laryngeal symptoms having disappeared, and the voice nearly restored to its proper tone.

*Commentary.*—The two cases above recorded point out to you in a very marked manner the great advantage to be derived from the method of local application to the larynx, introduced by Dr. Horace Green, of New York. This practice consists in the direct application of a solution of nitrate of silver to the interior of the larynx and trachea, by means of a bent whalebone probe, with a piece of sponge fastened to its extremity. Numerous attempts had been made, with more or less success, by Sir C. Bell, Mr. Vance, Mr. Cusack, and MM. Trousseau and Belloc, to carry this practice into effect, and the results obtained, even by their im-

perfect efforts, exhibited the great advantages which were to be derived from it in the treatment of laryngeal diseases. Now, thanks to Dr. Green, we can with safety and certainty apply various solutions directly to the parts affected, and the two cases you have observed must convince you of the benefit which patients so treated may obtain. In case I. you have observed the progress of a tolerably acute case of laryngitis from its commencement to its termination,—the distressing symptoms produced and the loss of voice occasioned. You have remarked, I trust, the gradual increase of the disorder, from its commencement on the 24th May until the 6th of July, when you saw Dr. Green himself pass the sponge into the larynx, and the immediate effect it occasioned. Lastly, from that moment you saw the case get better, and its termination in perfect cure eight days afterwards. No stronger evidence could be offered you in any single case of the benefit to be derived from a local application, especially when it is considered that the usual treatment was actively employed, consisting of leeches externally, gargles, and the application of a strong solution of nitrate of silver to the fauces, pharynx, and epiglottis. It was only when the application was made directly to the part affected that good was obtained. The second case, though more chronic, and though she went out before a perfect cure was obtained, is also calculated to impress upon you the value of this treatment.

The instruments to be employed are, first, a tongue depressor, with a bent handle, by means of which the tongue can be firmly pressed down, so as to expose the whole of the fauces, and the upper edge of the epiglottis. In doing this, some patients experience no inconvenience, whilst in others there is such excessive irritability, that spasmodic cough or even vomiting is occasioned, which prevents the possibility of seeing the epiglottis. Secondly a whalebone probang, about ten inches long, having at its extremity a round piece of the finest sponge, about the size of a gun or pistol bullet. The probang towards the extremity, must be bent in a curve, which, according to Dr. Green, ought to form the arc of one quarter of a circle whose diameter is four inches. Sometimes the curve must be altered to suit particular cases; and when it is thought necessary to pass it into the trachea, the curve must be considerably less. It is important that the sponge be fine, and capable of imbibing a considerable quantity of fluid; that it be *sewn* firmly to the extremity of the whalebone, and that this last should not be cut in the form of a bulb, but tapered as much as is consistent with firmness.

The solutions of the nitrate of silver which will be found most useful are of two strengths. One is formed of ℈ij. and the other of 3j. of the crystallised salt to an ounce of distilled water. On some occasions a solution of the sulphate of copper has been found beneficial, and it is very possible that as our experience of this kind of treatment extends, the application of other substances in solution may be found capable of meeting particular indications. Dr. Hastings, of London, speaks highly of the bicyanurate of mercury employed in this way.

The method of introducing the sponge which I have found most successful is as follows:—The patient being seated in a chair and exposed to a good light, you should stand on his right side, and depress the tongue with the depressor held in the left hand. Holding the probang in the right hand, the sponge having been saturated in the solution, you pass it carefully over the upper surface of the instrument, *exactly in the medium plane*, until it is above or immediately behind the epiglottis. You now tell the patient to inspire, and as he does so, you drag the tongue slightly forwards with the depressor, and thrust the probang downwards and forwards by a movement which causes you to elevate the right arm, and brings your hand almost in contact with the patient's face. This operation requires more dexterity than may at first be supposed. The rima glottidis is narrow, and unless the sponge come fairly down upon it, it readily slips into the œsophagus. Its passage into the proper channel may be determined by the sensation of overcoming a constriction, which you yourself experience when the sponge is momentarily embraced by the rima, as well as by the momentary spasm it occasions in the patient, or the harsh expiration which follows,—symptoms which are more marked according to the sensibility of the parts.

If the probang be properly prepared, and the operation well performed, the actions which take place are as follows:—1st, The sponge, saturated with the solu-

tion, is rapidly thrust through the rima into the larynx, and frequently into the trachea; for if the distance of the probang be measured from that portion of it which comes in contact with the lips, the extent it has been thrust downwards can be pretty accurately determined. I am persuaded that on many occasions I have passed it pretty deep into the trachea, not only from the length of the probang which has disappeared, but also from the sensations of the patient, although this may be thought by some a fallacious method of determining the point. In this first part of the operation, the rima glottidis is as it were taken by surprise, and the sponge enters, if the right direction be given to it, without difficulty. But, 2nd, the rima glottidis immediately contracts by reflex action, so that on withdrawing the instrument you feel the constriction. This also squeezes out the solution, which is diffused over the laryngeal and tracheal mucous membrane. Now, if the sponge be a fine one, it will be found capable of holding about 3ss. of fluid, the effect of which upon the secretions and mucous surface almost always produces temporary relief to the symptoms, and strengthens the tone of the voice,—results at once apparent after the momentary spasm has abated. 3rd, The action of the nitrate of silver solution is not that of a stimulant, but rather that of a calmative or sedative. It acts chemically on the mucus, pus, or other albuminous fluids it comes in contact with, throws down a copious white precipitate, in the form of a molecular membrane, which defends for a time the tender mucous surface or irritable ulcer, and leaves the passage free for the acts of respiration. Hence the feeling of relief almost always occasioned—that diminution of irritability in the parts which is so favourable to cure; and why it is that strong solutions of the salt are much more efficacious than weak ones. It may be easily conceived that such good effects must be more or less advantageous in almost all the diseases that affect parts so sensitive, from whatever cause they may arise; and that this treatment is not adapted to one or more diseases of the larynx, but, like all important remedies, meets a general indication which the rational practitioner will know how to avail himself of.

The mucous membrane of the larynx consists of ciliated epithelium externally, a basement layer below this, and areolar tissue internally, richly supplied with blood-vessels. Scattered over its surface are numerous follicles, which secrete mucus. It is liable to the same structural alterations as all other similar membranes, which may be divided into—1st, Exudation into the areolar tissue, between the basement membrane and epithelium, or upon the external surface; 2d, Abrasions or desquamations of the epithelial layer; 3d, Ulcerations extending more or less deep into the areolar tissue; and fourth, obstruction, swelling, and subsequent ulceration of the mucous follicles, a lesion particularly described by Dr. Horace Green, and denominated by him "follicular disease of the air passages." These different lesions may be more or less complicated with each other, and will vary in intensity according to the rapidity of their progress, and the extent to which the mucous membrane is implicated. Sometimes the exudation is thrown out quickly and infiltrates the textures, as in œdema glottidis, or in malignant angina. At other times it is poured out on the surface, as in croup. More frequently it is partial, occasioning subsequent abrasion or ulceration, and is allowed to become chronic. Perhaps the most common form it assumes is when it is chronic from the commencement, sometimes dependent on atmospheric changes, at others following repeated attacks of "cold;" in a third class dependent on too much straining of the voice, as occurs in public speakers, clergymen, singers, &c., and occasionally connected with some general constitutional disorder, as syphilis, tuberculosis, or some form of cancer. All these forms of laryngeal disease may be further associated with similar lesions of the fauces, tonsils, uvula and pharynx.

The symptoms will of course vary according to these different circumstances. The acute forms are accompanied with general fever, considerable local pain, more or less obstruction to deglutition and respiration, and loss or alteration of the character of the voice. As a general rule, it may be said that lesions of the fauces, tonsils, and neighbouring parts, are indicated by greater or less difficulty or uneasiness in swallowing, whilst the laryngeal disorder is evinced by changes in the character or power of sustaining the voice. Thus, as a general result of the local irritation, spasmodic action is evinced, and we have cough, at first dry, but after-

wards attended with mucous or purulent expectoration, and not unfrequently with discharge of blood. Elongation of the uvula may produce these effects. It has been lately supposed that hooping-cough is only an obscure form of laryngeal disease. In the more acute and extensive cases of exudative laryngitis, the spasms are more violent and prolonged, and the greatest caution is necessary in watching persons so affected, lest, from sudden and continued closure of the glottis, fatal asphyxia be induced.—*Monthly Journal of Med. Science, November*, 1851, *p.* 462.

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42.—*Membranous Croup successfully treated by cauterizing the Larynx with Nitrate of Silver.*—Dr. S. D. Townsend was called early in the morning, to a girl five and a half years of age, who had been unwell for two days. The croupy breathing did not come on until a short time before he visited her. She was treated with Dover's powder repeatedly during the day, and the room was filled with vapour by immersing heated irons occasionally in a tub of hot water. Cauterization with nitrate of silver was practised at noon and in the evening without much relief; at twelve p.m., the croupy respiration increasing, the patient was fast sinking from suffocation; the pulse intermittent; the caustic was more effectually applied. Expectoration of a portion of the membrane, an inch in length and half an inch wide, followed in fifteen minutes; relief was immediate; ether was also inhaled with a happy effect, producing a pleasant sleep. Several portions of membrane were expectorated during the night and the following day, and the respiration became natural. No patches of lymph upon the tonsils or fauces were discovered. At this time, seven days from the attack, the patient is playful, with a good appetite. Expectoration purulent and bloody. Has had no return of dyspnœa, but still speaks only in a whisper.—*American Journal of Med. Sciences, July*, 1851, *p.* 85.

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## DISEASES OF THE ORGANS OF DIGESTION.

### 43.—ON THE GASTRIC JUICE.

By Dr. H. Bence Jones, F.R.S., &c.

[The conclusion which Dr. Bence Jones arrives at, as to the action and use of the gastric juice, is, that its proper action is for the solution of albuminous substances. He says:]

That this action is prompted, first, by *temperature;* for it is found that at an ordinary temperature, say from 54° to 60°, the temperature of this room, no solution takes place. I have the contents of a stomach, which have been here for many hours, and probably there is not now a particle more in solution than when the contents were first removed; the temperature of the room has been sufficiently low to check all further action; and it must be raised to 96° for a further solution to take place. The next great agent is *motion.* During the time of digestion, a certain motion is, without doubt, constantly taking place in the stomach; but digestion may take place without any such contraction or gentle rubbing as one may suppose the stomach to be undergoing; this is proved by the fact that food will digest when placed in perforated balls, which allow the mixture of the food with the gastric juice. Thirdly, *salts* are of importance in the process of digestion. Common salt, without doubt, promotes the secretion of acid by its irritation and by its chemical action on the mucous membrane of the stomach. If very much common salt, however, is taken, the process of digestion appears to be retarded. So also with other salts. It is probable that even *calomel* has this property of stimulating the mucous membrane of the stomach, and thus, at times, of aiding the digestive process. Another great agent in promoting the action of the gastric juice, is *the removal of substances as soon as they are dissolved.* As soon as substances are dissolved they are enabled to escape, some of them by being absorbed into the veins, and some of them by passing out through the pylorus. That some of these soluble matters are constantly being removed from the stomach by the veins is proved by tying the pylorus, and finding that in the case (for instance) of

a stomach filled with milk, the watery part of the milk will be taken up from the parietes of the stomach by the veins, whereby the casein is left and is much more slowly dissolved; it is certain that the solution is always going on, that a part of the contents of the stomach is always being dissolved, while the process of digestion is proceeding. Lastly, it has been shown by the experiments of German physiologists, that atmospheric air is not at all necessary to aid digestion. If the contents of a stomach be placed in a perfectly air-tight vessel, and exposed to a proper temperature, digestion will take place.

We come, then, to the conclusion, that the ferment in the saliva is the substance which acts chiefly upon the most important non-nitrogenous constituent of our food, namely, starch; and that the ferment in the gastric juice acts chiefly upon the albuminous or nitrogenous constituents. Agents that stop fermentation stop digestion; for example, strong acids, alkalies, heat, alcohol. The stomach ferment differs from the saliva ferment, in losing its action when heated, or when treated with strong acid or alcohol; also by its necessary union with an acid. The acid determines the mode of action and regulates it. If carbonate of potash or soda is added in excess, a totally different action of the ferment ensues, decomposition begins. Slightly altered ferment, like slightly altered yeast, may set up lactic or butyric acid fermentations, and there is reason to suppose that acetic acid fermentation may also occur. You will remember that the substances existing in the food I divided thus:—Water, which can be taken up of itself; mineral matters, which are soluble in water or in dilute acid; non-nitrogenous organic substances, some soluble, as sugar, and others, as starch, insoluble in water, but acted upon immediately by the saliva; others, as cellulose, insoluble even by the saliva or gastric juice, and which cannot, therefore, serve for the nutrition of the body; and, lastly, nitrogenous substances. The fluid which acts upon this last class of substances is the gastric juice; it is the proper agent for rendering them soluble. It converts the albumen, fibrin, and casein, into albumen peptone, fibrin peptone, and casein peptone, which are soluble in water, and are, therefore, easily taken up into the body to serve the purposes of life.—*Med. Times, June* 14, 1851, *p.* 635.

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## 44.—ON THE VARIATIONS OF DIFFERENT INGREDIENTS OF THE BLOOD BY MEANS OF FOOD.

By Dr. H. Bence Jones, F.R.S., &c.

[In the blood we have water, salts, albuminous substances, and non-nitrogenous organic matter; the effect of food upon these substances is very interesting.]

In the following diagrams are represented the effect of food on the amount of albumen, fibrin, and fatty matter in the blood. You will observe, that after starvation, the quantity of albumen present in the blood is 66·8 parts in 1000 parts of blood; and after food, 90·8 parts in 1000; showing a decided increase produced by food. In the blood of man, when a mixed diet was taken, albumen 53·2 parts per 1000 parts of blood were found; on animal food, the 5th day, 58·7 parts; the fourteenth day, 62·7 parts per 1000. The fourteenth day of vegetable food, 51·0 parts albumen; showing that animal food decidedly increases the albumen in the blood, and that vegetable food does not produce so decided an effect.

With regard to fibrin: the blood of man, when no food was taken, gave 1·8 parts per 1000 parts of blood (the average being about 3 per 1000); after animal food, the third hour, the fibrin was 1·5 parts per 1000; the fifth hour 1·6, &c.; so that the digestion of food does not seem to increase the fibrin of the blood. After the eighth hour, however, when digestion must be ended, the amount of fibrin comes back to the amount which was present before food was taken.

*Effects of Food on the Albumen, Fibrin, Water, Salts, and Fat in the Blood.*

| | | Per 1000 parts of Blood. |
|---|---|---|
| Albumen—Horse after starvation | | 66·8 parts. |
| „ food | | 90·8 „ |
| Man—mixed diet | | 53·2 „ |
| „ animal food | 5th day | 58·7 „ |

| | Per 1000 parts of Blood. |
|---|---|
| Man—animal food . . . | 14th day 62·7 parts. |
| „ vegetable food . . . | 14th day 51·0 „ |
| Fibrin—Man after no food . . . | . . 1·8 „ |
| „ animal food | 3rd hour . . 1·5 „ |
| „ „ | 5th „ . . . 1·6 „ |
| „ „ | 6th „ . . . 1·5 „ |
| „ „ | 7th „ . . . 1·4 „ |
| „ „ | 8th „ . . . 1·8 „ |
| Dog, starvation 11 days | . . . 1·5 „ |
| „ 9 days | . . . . 2·7 „ |
| „ after full animal food | . . . . 2·2 „ |
| Water—after animal food . | . . . . 784 „ |
| after vegetable food | . . . . 792 „ |
| Salts—Twenty-four hours' starvation | . . . 6.9 „ |
| Eight hours after animal food | . . . 8·2 „ |
| „ „ vegetable food | . . . 7·7 „ |
| Fat—Twenty-four hours after starvation | . . . 2·0 „ |
| After animal food . . . . | . . . 2·9 „ |
| „ vegetable food . . . | . . . 2·1 „ |
| „ nine days' starvation | . . . . 1·7 „ |
| „ eleven days' starvation | . . . . 1·4 „ |
| In disease . . . . . | . . . 117·0 „ |

I deduce, then, from this table, that the fibrin is not increased by food. In a dog starved for eleven days as much fibrin was present in the blood as was usually found when food was taken; and after nine days' starvation there was found as much as 2·7 parts of fibrin in 1000 parts of blood. With regard to the influence of different kinds of food, one animal was kept for weeks on flesh only, and another was kept for the same time on vegetable food only; both were bled from six to nine hours after a meal. The proportion of fibrin in the two specimens of blood was represented by 9 to 7.

With regard to the salts in the blood, there are, after twenty-four hours' starvation, 6·9 parts of saline matter in 1000 parts of blood; eight hours after animal food 8·2 per 1000; after vegetable food 7·7 per 1000.

As regards the effect of food on the amount of fat in the blood, after twenty-four hours' starvation, there are 2 parts of fat in 1000 parts of blood. The Table shows that starvation causes a gradual diminution of fat, and that food causes an increase, but in some states of disease the amount of fat is increased far beyond the healthy limit. I believe that 117 parts of fat in 1000 parts of blood is the highest ever known to have occurred in man.

The quantity of water after animal food is 784 parts of water in 1000 parts of blood, and after vegetable food 792 per 1000; so far showing that vegetable food causes a more watery state of the blood than animal food does. Still the quantity of water in the blood is not very closely dependent on the quantity of water which is taken into the system. On this point some very interesting experiments have lately been made. Two dogs were kept for some weeks on the same food, except as regarding the quantity of water given to them. One dog was not given any water, and the other was made to take a large quantity. It was found afterwards, that the specific gravity of the blood taken from the two dogs varied very little. It was almost the same in both.

Still very large draughts of water do occasionally produce very decided effects on the blood of animals. If, after the blood has been drawn, I take the blood-globules, and mix them with distilled water, and then examine the liquid under a microscope, I shall find, if sufficient water has been added, that the blood-globules will have ceased to exist. Pure water has a powerful action upon them. It bursts, and breaks and dissolves them, causing them to vanish entirely. A clear solution like this of blood-globules is formed. Now, the same action is said to take place in animals after very large draughts of water. It is stated that in oxen, after taking immense draughts of water, the blood-globules have been so acted upon as to become dissolved, and that the colouring matter has passed out

of the body. This has continued until so much water has passed from the animal as has sufficed to restore the proper specific gravity to the blood.

I have here a liquid containing blood-globules, in a strong solution of sulphate of soda. The quantity of sulphate of soda is so considerable in proportion to the water, that the globules are unacted upon. If the blood had been put into distilled water, instead of into a solution of sulphate of soda, the globules would have been dissolved, and have formed a clear, colourless liquid. It is simply the salts of the blood which hold the albumen in solution; and it is these same salts, also, which prevent the coloured globules from being dissolved.

Thus much regarding the influence of the food on the substances in the blood. You will find more on this subject in the pamphlet of Nasse, on the 'Influence of the Food on the Blood'; in the pamphlet of Mulders, on 'Nourishment'; and in 'Lehmann's Chemistry,' under the head of 'Blood.'

[Another interesting inquiry entered upon by Dr. Jones, is the relation of the blood to the substances which are passing out of the body—to the excretions.]

One of the most interesting substances, and certainly the most important one, is carbonic acid, which passes out by respiration. By a very easy and beautiful experiment I can show you its presence in the blood. I have here an apparatus which will produce hydrogen. I have a tube full of caustic potash, which will stop any trace of carbonic acid which can possibly exist. Sulphuric acid is made to act upon zinc so as to produce hydrogen; this hydrogen passes through the solution of caustic potash; it then passes into another vessel, into which, when filled with the hydrogen, some healthy blood is put; the hydrogen bubbling through this, passes through some lime-water in other vessels; and if it carries with it any carbonic acid, the lime-water will of course become turbid. You see how rapidly this turbidity is produced. Carbonic acid, then, is a substance which exists in the blood, and is passing out each moment by respiration. The proportion of carbonic acid to oxygen, in arterial blood, is as 16 of the former to 6 of the latter; and, in venous blood, 16 carbonic acid to 4 oxygen. This proportion was determined for us by the German chemist, Magnus. He found that the quantity of nitrogen was the same in both kinds of blood. M. Majendie states, that in venous blood, in every hundred volumes, there are seventy-eight volumes of carbonic acid gas, and in arterial blood 66 per cent.

Other substances can be obtained from the blood which are constantly passing out of the body in the urine. The most interesting of these are uric acid and urea, substances which form the peculiar characteristic constituents of the urine. These can be found in small quantities in healthy blood. I have here a beautiful specimen in long crystals of urea obtained from the healthy blood of an ox, for which I am indebted to M. Verdeil. It is obtained by drying the serum of the blood, reducing it to the finest powder, mixing it with alcohol, and then pouring off the alcoholic solution, which, in health, always contains small quantities of urea. In some diseases the quantity of urea in the blood is considerable—as for instance in Bright's disease. In this disease the blood-globules are exceedingly diminished—the albumen is constantly passing out in the urine; and it is always found that urea is one of the constituents of the serum. It may be obtained thus:—Here is the serum of a patient who was bled in St. George's Hospital. Here is a portion evaporated to dryness; a part of this dry residue is treated with absolute alcohol, the alcoholic solution is evaporated in vacuo to dryness; and the dry residue is dissolved in a little water; on the addition of nitric acid nitrate of urea as you see immediately crystallises.

Uric acid is also found in the blood in health and in disease, combined with soda. It was discovered by Dr. Garrod, of University College; he states that it exists in increased quantity in the blood of gouty subjects; and, from my own experiments, I can confirm the truth of his statement. Dr. Garrod also says, that he found in Bright's disease urate of soda in excess in the blood. In that disease the kidney is prevented from performing its proper functions; the ingredients of the urine are not separated as they should be, and thus urea and uric acid accumulate in the blood. Uric acid, like urea, can be easily detected, by taking the serum or the blood as a whole, evaporating it to dryness, reducing it to the finest powder, and treating it with boiling water; urate of soda will thus be obtained in solution. The liquid is filtered off from the insoluble albumen, and the clear fluid is mixed

with strong acetic acid, and set aside to crystallize. The uric acid adheres to the sides and bottom of the glass. It may be collected, and will give the characteristic reactions with nitric acid and ammonia.

Kreatin, which I formerly mentioned as one of the constituents of the flesh, probably exists in the blood. It exists certainly in the urine, as I shall have to show you. Hippuric acid, also, which exists in the urine, especially in graminivorous animals, has been found in the blood. It was detected in the blood of an ox, by M. Verdeil. Lastly, Dr. Garrod also considers he has found oxalic acid in the blood of a patient in University College Hospital.

Thus, then, there exists in the blood not only the substances which pass into the body as food, but the substances which pass out in the excretions. I have said that the great peculiarity of the blood is, that it contains fibrin and the red globules; these substances cause the blood to differ from all other fluids. The spontaneous coagulation and the red colour are caused by the globules and the fibrin; neither of which exists ready formed in the food, nor are they ever found in the healthy excretions. If it were not for these substances, it might almost be said that the blood was nothing but a solution of food passing in, and of substances passing out of the body; it is, then, by the formation of the fibrin and blood-globules, that the blood is made a peculiar substance,—an organised liquid, which may live and die like the more solid organs of which we are composed.—*Medical Times, August* 2, 1851, *p.* 115.

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## 45.—ON THE BILE.

By Dr. H. Bence Jones, F.R.S., &c.

[The bile has long been a subject of the greatest speculation on the part of physiologists, and there is scarcely any theory which has been advanced on the properties of the bile, which has not been defended by some writers. Dr. Jones compares it more to a kind of soap than anything else, and proceeds to enquire:]

What is the physiological action of the bile? The most opposite and the most important actions have been attributed to it. It has been said to promote digestion, and to stop digestion. Some say that it neutralises free acid, thus lessening irritation; others, that it increases the peristaltic action of the bowels, thus increasing irritation. It has been said to be partly absorbed into the system to support respiration, by furnishing a highly carbonaceous body. Some have said that it promotes the absorption of fatty substances; and by others it has been said to have no action upon fats at all. To solve these questions was the difficulty. Experiments were tried by tying the common duct through which the bile passed; but this is not the way to arrive at a satisfactory result. If the bile is not suffered to pass, a stoppage is put to the functions of the liver; the whole order of the system is thrown out, and general disorder is produced. In 1844 a new mode of experimenting was begun by Schwann, who collected the bile without allowing it to pass into the intestines, by means of an opening similar to that which I mentioned in the case of the pancreatic duct. The action of the liver thus went on as usual, and all the functions of the body were performed without impediment. Twelve dogs lived from sixty-four to eighty days without any bile passing into the intestines: one dog, thus experimented upon, lived four months; and another, belonging, I believe, to M. Bernard, lived a year in this state. It was found that dogs thus treated ate much, and digested badly, partly in consequence of the unnatural fistulous opening. They did not lose much weight at first; but after a little time they lost their appetite, became thin, and ultimately died. The bowels acted as regularly and perfectly as if the bile had passed in the usual manner. Professor Nasse had a dog that lived from the 12th of August to the 27th of January. The quantity of bile varied with different kinds of food between 31 grains and 370 grains daily, with from 16·44 to 19·19 per cent. of solid constituents. Less was secreted when the dog was ill. The dog ate much; digested badly; did not lose weight at first; afterwards lost its appetite, and then became thin. M. Blondlot had a dog that flourished for three months. The bowels acted twice daily.*

* At the meeting of the French Academy, on the 23d of June this year, M. Blondlot gave the history and post mortem of a dog that lived for five years without bile passing into the intestines.

Even in human subjects, it has been found that when a fistulous opening has been made, owing to perfect obstruction of the common duct, by inflammatory action, the bowels have continued to act when the bile did not pass,—showing that the bile is by no means indispensable for their action.

Many experiments were tried with dogs, as to the quantity of bile secreted. The influence of medicine was also tried; and it is interesting to us to know that the action of mercury was decidedly to increase the quantity of bile secreted, as has long been held by medical men. If animals can live for a year, enjoy tolerable health, and digest their food, without any bile passing into the intestines, the importance of bile, and its necessity for the purposes of digestion, have been exaggerated.

The action of bile out of the body on the different constituents of food, tends to precisely the same results as we have seen obtained by experiments in the body. Bile, when mixed with neutral fat or with oil, is found to have no chemical action whatever. It makes a sort of emulsion only, not quite so good as that produced by the pancreatic fluid. I added to solutions both of pancreatic juice and bile, equal quantities of water and oil, and then left them, after agitation for some time, to see which produced the most enduring emulsion. You see them here; both have caused the fatty matter to be minutely divided; but I think the pancreatic fluid has divided it and kept it divided the best. When fresh out of the body bile has no action on starch; it does not change it into sugar, as we saw the saliva did. When, however, it is allowed to decompose, it has a slight action upon starch; but not more than all animal substances have. It has no action on cane-sugar until after it has stood for a considerable length of time, and then the cane-sugar is converted into acid. With grape-sugar, if left for any length of time, it forms lactic acid; but so do all other animal substances when in contact with sugar. It has no action, even when acidulated on casein, or on the albuminous substances which constitute our food.

It has been said that the liver purifies the blood by removing a large quantity of carbonaceous substance from it. To determine this by absolute experiment was a matter of great difficulty; but Schmidt has endeavoured to solve this question by experiments on forty cats, thirteen geese, many sheep and rabbits, in which he made fistulous openings into the gall-ducts for the purpose of collecting all the bile and of determining the proportion between the quantity of carbonic acid thrown out by the lungs and the quantity of carbon in the bile. He passed a tube into the gall-duct, and could measure how much gall came out per hour; and he could determine the composition of the bile by burning it and collecting the carbonic acid. He made, at the same time, comparative experiments on the respiration, some of which I shall have to detail to you in a future lecture; and he came to the conclusion that not more than from one-tenth to one-fortieth of the carbon which passes out of the body passes by the liver, and that therefore the liver has no considerable action in freeing the blood from carbonic acid or carbon. He found that eight-ninths or nine-tenths of the carbonaceous matter remains in the circulation, and does not pass out by the bile at all, but is thrown out through the lungs; a small portion, however, must escape in the urine, probably not much less than passes out in the bile. But I am unable to give you the proportion of carbon in the urine and bile daily excreted, from want of experiments.

What, then, in conclusion, are the uses of the bile? I have shown you that it is an alkaline fluid, and a body resembling soap. If soap is brought into contact with an acid, you know what happens: the alkali of the soap and the acid combine, and the acid of the soap is set free and precipitated. So, also, is it in the bile. If I take human bile, and mix it with acid, (as you see in the experiment with sulphuric acid,) a greenish white precipitate is formed. Let me show you what would happen to human bile, if mixed with the acid secretion of the stomach. This I can do by adding dilute hydrochloric acid to a portion of bile, or better still by mixing some of the clear fluid obtained from the contents of the stomach, which I showed you in my lecture on the gastric juice; by both a precipitate will be immediately produced. The alkali which exists in the bile goes to the acid; it neutralizes so far, the acid reaction coming from the stomach; and it precipitates the insoluble acids, which give rise to choloidynic acid, and even to that still more

insoluble substance, dyalysin, in its passage through the intestinal canal. It appears to me, then, that one great action of the bile is to furnish an alkaline fluid, which, when mixed with the acid secretion that has served the purpose of dissolving the albumen, will neutralize it, and lessen its acidity, so as to prevent it from producing irritation and increased action of the intestinal canal. That the stomach can actually bear much stronger acid than the bowels is known to most medical men. That the acid does not pass rapidly out of the stomach I am convinced by the following experiment:—To an adult man I gave 162 grains of dry, pure tartaric acid dissolved in two ounces of water. No pain was felt for three hours; no food was taken during this time; and, without doubt, all the tartaric acid would in these three hours have been absorbed, or would have passed out to the stomach. At the end of this time a pain in the bowels began to be felt, and at the end of the fourth hour there was very considerable pain, coming on in paroxysms. At the lapse of about five hours, if the bowels had been allowed to act, they would have acted from the acid thus taken. A repetition of the experiment, with 84 grains, gave precisely the same results. When the acid entered the bowels, pain began to be felt, and, if bile in plenty had been poured out, the acid would have been neutralized, in part at least; the alkali would have combined with the acid; the insoluble bile acid would have been formed as a precipitate, and been thrown out of the body. If this be so, sluggishness of the liver, a deficiency of alkali poured into the duodenum, becomes a reasonable cause of excessive acidity of the intestines; the gastric acid required to dissolve the albuminous food, if sufficient bile is not formed, will pass into the intestines, and produce irritation and increased action. The physician has long held, that want of action of the liver gives rise to acidity, and that alterative medicines correct this state.

But the very great size which the liver attains in the fœtus appears to indicate that it performs some additional action independent of food and of digestion. This additional action has been said, by German physiologists, to be the reparation and the formation of blood globules; but this is by no means proved. It seems to me much more probable that it is for the purpose of neutralizing the acid, and probably also, for the purpose of removing, when requisite, some of the carbonaceous substances; in certain states compensating for the action of the lungs, though, in ordinary states, removing much less carbon than has been said. The bile gives water, moreover, to dilute the chyle; it tends to the subdivision, in some degree, of the fat and the oil of our food. It acts upon the free acid of the intestine; and some of it may be possibly absorbed, and pass into the circulation again, as Professor Liebig originally conjectured. It is not nearly so important as the gastric juice, which dissolves the albuminous part of our food, or the pancreatic fluid, and the salivary fluid, which convert all the insoluble starch, as I have shown you, into soluble sugar. Lastly, the importance of the bile in forming sugar from fat, is one of those facts which cannot be overrated. By this discovery of M. Bernard's, very important knowledge relating to the physiology and pathology of man will be obtained during the next few years; at least there can be little doubt, that the disease known as diabetes, if not closely connected with this production of sugar in the liver, must at least be influenced by it to a very considerable extent.—*Med. Times, July* 5, 1851, *p.* 1.

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46.—*Inutility of the Bile as a Modifying Agent in Digestion.*—M. Blondlot gave it as his opinion, before the Academy of Sciences of Paris, that the bile exercises no chemical action on the chyme, and that digestion would proceed just as well without the interference of bile. He considers the latter fluid as a kind of detritus, of which the economy frees itself by means of the intestines.

M. Blondlot has been at great pains to set up biliary fistulæ upon dogs, so as to allow the bile to pass out of the body without reaching the intestine. After many trials he succeeded upon two dogs; one of these was killed one month after the establishment of the fistula, and it was found that digestion had been properly carried on, and that the ductus communis choledochus was already occluded.

The second dog lived *five years* with the fistula; it was a bitch, about four years old, who continued to enjoy good health, littered every year, and was a good

pointer. The bile escaped all this time; very scantily, however, when the animal was fasting, but very abundantly during the whole period of digestion. The bitch died after five years; the liver looked cirrhosed, and the ductus communis was quite atrophied. M. Blondlot, therefore, maintains that the bile is a mere detritus, which may, however, serve to protect the intestines from the irritating properties of the chyme, or aid. with other mucous fluids, in dissolving fatty constituents.—*Lancet, August* 23, 1851, *p.* 177.

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47.—*On Aphtha and its Important Relations as an Epidemic Disease.*—By John Grove, Esq.—[The conclusion Mr. Grove arrives at, from his investigations upon this subject, are:]

1st. That aphtha is a disease depending upon and caused by vegetable germs.

2nd. That, in all probability, muguet aphtha and diphtherite are associated affections, depending on a common primary agent as a cause of disease.

3rd. That the same general laws are operative on aphtha, diphtherite, and muguet, in their endemic and epidemic forms, as are known to apply to other endemic and epidemic affections.

4th. That, as analogical argument gives a preponderance in favour of living germs being the cause of epidemic disease, and that as such germs have been demonstrated to be the primary cause of aphtha, itself an epidemic affection, we may conclude that this is a type of all diseases which obey the same laws.—*Med. Times, July* 26, 1851, *p.* 98.

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48.—*Gastralgia. Treatment by the Subnitrate of Bismuth, united with Belladonna.*—The subnitrate of bismuth enjoys a certain reputation in the treatment of gastralgia. It cannot be said, however, to be an active and faithful remedy. Sometimes it does not act even in a large dose; at other times, its action is no longer exercised in cases where it had previously been administered with success. According to Professor Caizergues of Montpellier, the subnitrate of bismuth is more efficacious when united with belladonna. He orders this mixture in painful affections of the stomach, properly so-called, and which are isolated from all inflammatory complication, and against affections of the stomach which are connected with a positive disease, or a general morbid state, like chlorosis, for instance. The Professor generally employs the following formula. ℞. Subnitrate of bismuth, ten grammes, extract of belladonna one gramme; make forty pills, two to be taken night and morning.—*London Journal of Medicine, August*, 1851, *p.* 720.

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49.—*Pathology of Diabetes.*—We reprint the following from the 2nd vol. of the 'Transactions of the American Medical Association.' "For all practical purposes in the present state of our knowledge, we may, in the opinion of Dr. Todd, adopt with advantage the following view of the pathology of diabetes. 'That it is primarily a disease of the mucous membrane of the stomach, whereby an abnormal diastase is formed, which rapidly converts into sugar such aliments as admit of that conversion; the mucous membrane probably likewise secretes sugar; the sugar thus formed, passes into the blood, and is rapidly eliminated by the kidneys, causing, at the same time, the attraction to those organs of the elements of a large quantity of water."

"Very much to the same point are some interesting remarks of Professor Flint, in a late number of his Journal (Prov. Med. and Surg. J.,) on the pathology and treatment of this affection. 'The presence of sugar in the blood and various secretions other than the urine,' he remarks, 'renders it inappropriate longer to rank diabetes among renal diseases. It is a disease affecting the assimilatory process, in consequence of which sugar ingested passes unchanged into the blood-vessels, and alimentary principles capable of being converted into sugar undergo that chemical change. The kidneys are involved only as one of the excretory outlets by which this useless saccharine material is eliminated from the system. The hyper-secretory action of the kidneys, (which is probably due to the presence of

By giving at first a large, or what might be deemed by some an over-dose, we may, as I have often had occasion to observe, cure the disease at once, as by a blow; but if we fail in this, we are pretty sure to get, and are enabled to maintain, a perfect control over it in all its subsequent stages. It is of the utmost importance to treat the disease properly and efficiently at the outset; so thinking, we can fully appreciate the remark of Cheyne, who, speaking of the dysentery in Ireland, says, "Every successive visit more strikingly exemplified, in the helplessness of the second stage of dysentery, the infinite consequence of treating its first stage with skill." If treated as advised, the result mentioned will be often realized.

When the discharges have been suspended some twenty-four, thirty-six, or forty-eight hours, a gentle laxative, as rhubarb and magnesia, or castor oil, with or without paregoric, may be ordered, especially if the patient feel a sense of fulness in the abdomen, or indeed any other sensation which he thinks would be relieved by an evacuation from the bowels. When the bowels have responded some two or three times to the laxative, and manifest a tendency to continue their movements, another powder should be given after the third motion, or after the second, if there be pain, or plainly indicated renewal of diseased action, in which case the dose should be repeated after each succeeding discharge.

When the disease has been arrested in the manner described, the cure may be often left entirely to nature, i.e., without even recourse to the laxative.* When this has been withheld, the first motion from the bowels is generally natural, or nearly so, and the patient convalescent. An infusion of gentian or some mild tonic completes the cure.

In the complications of fever with dysenteric symptoms, the writer's experience has led him to believe that the acetate of lead and opium, given as recommended in this paper, is the remedy which in such cases affords the most certain relief by correcting morbid secretions and controlling abnormal action.

*Objections to the use of Acetate of Lead.*—These grow out of the groundless fear of poisoning the patient, by inducing either colic, or that species of palsy, of which lead is supposed to be the specific cause. Having used the acetate as an internal remedy, as much perhaps as any other medical man, I can speak from considerable experience, and say that in no case whatever have I known any ill consequences follow its use; neither do I believe any will ensue if it is combined with opium, by which its action, and indeed that of each drug, is reciprocally modified by the other; consequently opium, with the acetate of lead, may be given with great satisfaction to many persons who from idiosyncracy cannot take it *per se*.

But does the acetate of lead act as a poison when given in suitable doses? Without referring again to our own experience, or that of other gentlemen, with whose practice we have been familiar, or the recorded testimony scattered through the books, we shall make a few extracts from Pereira's 'Materia Medica,' pages 664, 5, and 6, vol. 1. Speaking of the "acetate of lead," he says, "Applied to ulcers, mucous membranes, or other secreting surfaces, it acts as a desiccative and astringent. It reacts chemically on the albumen of the secretions of the living tissues, and forms therewith compounds which are for the most part insoluble in water or acids. Hence the difficulty with which this salt becomes absorbed." A good and substantial reason why it is harmless when given as a medicine. Again, he says, "In large quantities, acetate of lead taken into the stomach acts as an irritant, and causes symptoms of inflammation of the stomach, viz., vomiting, burning in the gullet and stomach, and tenderness at the pit of the stomach; but these are usually accompanied with colica pictonum, and are not unfrequently followed by convulsions, coma, or local palsy."

"Ten grains," continues Pereira, "taken daily for seven days, caused tightness of the breast, metallic taste, constriction of the throat, debility, turgid and tender gums, ptyalism, tightness and numbness of the fingers and toes, pains in the stomach and abdomen, bowels confined." "The observations of Dr. A. T.

* The writer has no scruples, even when infants and children are the subjects, unless there is a manifest disposition to cerebral disease, in which case, and indeed in all, it is well and proper to watch tendencies and results. We have found cholera infantum more effectually and certainly cured by the acetate of lead and opium than by any other means or remedies with which we are acquainted. To an infant, six months old, affected with this disease, we give one twelfth of a grain of opium with one sixth of a grain of the acetate after each discharge, up or down, more or less, or modified according to circumstances.

Thompson and others (Van Swieten, Reynolds, Latham, Laidlaw, Christison), have, however, shown that injurious effects, from the use of large doses, are very rare. The acetate of lead in solution applied topically to an inflamed part we all know acts "as a sedative, astringent, and desiccative," from which properties its utility as an enema in dysentery has been inferred. Thus applied to the inflamed mucous membrane of the rectum, it seems to be a most appropriate remedy. If it has failed to produce the expected good, or has aggravated the symptoms, it is in consequence, as we believe, of having been improperly used. The principle on which it was administered, as well as the *methodus medendi*, were wrong. The usual method is to dissolve the salt in six, eight, ten, or twelve ounces of water; a quantity which distends the gut, and causes it to be applied to a large extent of surface—two things to be avoided; thus used, it produces distress and excites action; whereas, to do good and no hurt, the quantity of liquid should be small—seldom if ever exceeding one or two ounces for an adult, and for a child in proportion; and the pipe through which it is conveyed into the intestine should be quite slender, and long enough to reach beyond the internal or upper sphincter, and introduced with care to avoid giving pain or exciting the rectum to action—in order that the solution may be retained as long as possible, the patient should therefore be instructed to resist resolutely the desire to eject it. Moreover, the solution should be weak. If too strong, it will irritate the inflamed gut by its chemical properties, and do quite as much harm as when the quantity is too large. The following proportions, it is believed, will be found adapted to most cases:—℞. Acetate of lead, 6 grs., pure water 1oz., laudanum, from 30 to 50 drops, mix for an enema—to be given and repeated according to the frequency of the discharges, and retained as long as possible. In each individual case the repetition must, however, be regulated by attendant circumstances. Judging from our own observation and experience, we are entirely satisfied with the safety as well as propriety of using the acetate of lead in the manner recommended; and we cannot but think that gentlemen who will take the trouble to investigate the matter and try the remedy will arrive at the same conclusion. Admitting that it is not perfectly harmless—that now and then it produces mischief, is it more than might be justly charged to the account of some of our most valuable and valued remedies? Compared with calomel, its mischievous effects are as "a very little drop to the mighty deep."

*Posture or Position.*—Position and quietude of the patient are among the most important items in the cure of dysentery. The recumbent posture should be most authoritatively enjoined and rigidly insisted on—from it the patient should not be allowed to depart—not even when a discharge from the bowels is indispensable. The bed-pan should be used, and during its use the limbs should be kept extended—not drawn up as they usually are when that utensil is used. If the discharges are small, as they commonly are, it is better that they should be received on a folded sheet, than that either the bed-pan or *pot de chambre* be used.

*Elevation of the Pelvis.*—In addition to the recumbent posture, the writer is in the habit of directing, in severe cases, or those in which the tenesmus is very harassing, and the difficulty of repressing or resisting it great, that the pelvis should be raised by putting a pillow or two underneath the hips. It is hardly credible to one who has not experienced it in his own person, how much relief this simple expedient is capable of affording. Immediately after its adoption, the patient begins to feel the blood and humors flow, and even the intestines themselves rolling or swaying backward or upward from the seat of disease towards the navel, and in about an hour or two finds himself comparatively relieved.

[This posture will be found not much less useful in the treatment of many other affections, as hæmorrhoids, inflammation of the testes, bladder, uterus, &c.; the pelvis being again lowered to a level, and then again raised when the position becomes irksome.]—*New York Journal of Medicine, July*, 1851, *p.* 34.

## 53.—ON THE USE OF ACETATE OF LEAD.

By William Swepting, Esq., Abbotsbury.

[It is important that the vulgar prejudice of the poisonous nature of the acetate of lead should be exploded, and its value as a medicament established.]

Several interesting cases wherein acetate of lead has been administered in large quantities without destroying life, are recorded by Dr. Christison and Professor Taylor.

A woman was admitted into Guy's Hospital in May, 1846, having swallowed *an ounce and a half* of sugar of lead dissolved in water, from which she recovered, and left the hospital in five days.

Mr. Gorringe reported two cases in which two girls swallowed by mistake *one ounce* of the acetate, and another in which a girl swallowed one drachm, and all recovered.

Dr. Hirding gives a case in which a girl swallowed *three drachms;* she, too, recovered.

Dr. Iliff records *four* cases in which individuals swallowed each *an ounce;* and Dr. Evans one, in which *three drachms* were swallowed, and all in a very short time recovered. These cases, with the "observations and experiments of Orfila, prove that the vulgar belief that sugar of lead is an active poison, is erroneous."

The more important point to be submitted to the Association refers to the value of acetate of lead as a remedial agent, and in treating on this subject, the result of fourteen years' experience, and the conclusions I have arrived at, are laid before you. I have found that in this substance we possess a most powerful sedative; that it is unequalled in its capability of restraining internal hemorrhages and intestinal disturbance, and that it may be administered safely in much larger doses than were formerly supposed to be judicious. In the early years of my practice, when cases occurred in which it was deemed desirable to administer the acetate, the dose rarely exceeded one grain, repeated at long intervals, guarded, too, with opium and other adjuncts, in order to avert the injurious effects of what was popularly considered a poison, or at least the probable occasion of colic, palsy, &c.

It happened, about fourteen years since, that I was attending a gentleman's child, about seven years of age, labouring under typhus. I was summoned to him in the night, and found the child apparently sinking from colliquative bloody diarrhœa. There was no time for parleying; unless some very decided measures were adopted he would surely sink. In this emergency I administered *five grains* of the acetate dissolved in distilled water. The effect was immediate and surprising; the diarrhœa was checked, the child rallied, and at length fully recovered.

Soon after the foregoing case, two of Asiatic cholera came under my notice. To the first I gave five grains, which was speedily rejected; I then gave one grain every ten minutes. In the course of two hours the diarrhœa, vomiting, and cramps abated, and both patients recovered.

In uterine hemorrhage I have administered this medicine very largely; the following goes to prove that we have no great reason to fear mischief, either from the quantity or its accumulation:—

A woman of delicate health miscarried, and was nearly exhausted by hemorrhage, which all the ordinary appliances failed to check. On my visiting the woman, I found her pale, bloodless, the extremities cold, and apparently sinking. Having ascertained that the hemorrhage was not kept up by coagula retained in the uterus, and that the ovum had been wholly expelled, I gave her *five grains* in distilled water, and repeated it *every hour*. This was persevered in forty-eight hours. The hemorrhage was moderated, but as soon as the medicine was suspended, it returned again. I then ordered it to be taken every four hours, and continued it for a fortnight, with the happiest results, and the woman was so conscious of the benefit derived from it that she always kept a supply by her, to be taken as occasion might require. In this case, the patient took, in sixteen consecutive days, 576 grains of the acetate.

Large as the quantity before stated is, the practice is not without precedent, for *Van Swieten* administered *sixty grains daily for ten days*, but what the dose, and

at what intervals repeated, does not appear. The largest single dose I ever administered is twenty grains. Mr. Daniel, in a paper on its effects as a remedy for mercurial salivation, states that he has "given *ten grains three times a day*, and never observed it to produce any other unpleasant symptom except a slight colic after the fourth dose."

The boldness with which I have administered the acetate, is not the result of mere speculation, nor of observations made in one month or one year, but rather of patient and careful watching for the long period of *fourteen years*, during which time I have repeatedly directed the attention of my professional friends to the subject, at meetings of the Provincial Association, and communications with the periodicals of the day; and I aver, that during all that time I have never met with an instance in which the ill effects usually ascribed to lead have followed the administration of it.

In Professor Taylor's work is a record of a fatal case extracted from the 'Pharmaceutical Journal,' in which a child took, in small divided doses, continuously given in the space of *nine weeks*, *thirty-three grains*. It may not be altogether lost time to inquire whether minute doses may not have a tendency to accumulate in the system and produce its specific effects, whilst larger ones are carried out of it readily. A scruple of calomel passes harmlessly through the system; the same quantity given in small doses at certain intervals, produces violent ptyalism. There may be an analogy between these cases; the suggestion is merely thrown out for the purpose of directing future enquiry. I more than half suspect, that where acetate of lead, internally administered, has occasioned dangerous symptoms, the preparation has not been free from oxidation—it is the *oxide* which is injurious, it was that which was mixed with the cider in Devonshire, and gave a cognomen to the colic prevalent in that county. The same obtains in *painter's* colic; these people mix considerable quantities of litharge and red lead, technically called driers, with their oils, and neglecting careful ablution before taking their meals, imperceptibly swallow a material of a very dangerous character.

It has been suggested that an objection to the internal administration of acetate of lead, is its liability to decomposition by other drugs. There is much justice in the remark, reminding me that I ought to have insisted as essential, that the medicine should always be given, *simply dissolved in distilled water, without any combination whatever*. These decompositions may have been the occasion of much mischief, and hence opium, on which practitioners are used to rely as a protection, is on that account inadmissible. Care should also be taken to have the acetate very pure. The best preparation I have met with was furnished by Messrs. Preston, of Smithfield Bars, London.—*Prov. Med. and Surg. Journal, June* 11, 1851, *p.* 320.

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54.—*On the Acetate of Lead.*—By Dr. REGINALD BURRIDGE, Senior Physician to the Somerset and Taunton Hospital.—[Dr. Burridge remarks that he had constant opportunities of seeing the acetate of lead employed in doses of five to eight grains, by that eminent toxicologist, Dr. Christison, and adds,]

In the year 1837 the town and neighbourhood of Taunton was invaded by an epidemic dysentery, in which the superior value of lead, in my hands, was most conspicuous. I shall not scruple to give an outline of two cases illustrative of its efficacy, and of Mr. Sweeting's main position; the one from my private case-book, and the other from hospital practice.

In August, 1837, I was attending, with a very respectable surgeon of this town, a young lady of strumous habits, who was labouring under the then prevailing epidemic, or rather, perhaps, endemic. We were summoned very early one morning with an alarm that the patient was bleeding to death. The surgeon was prevented, by a midwifery engagement, from accompanying me—a distance of three miles—but I fortified myself from his surgery with half an ounce of acetate of lead and a bottle of compound spirits of ammonia. Arrived at the house, I was shown three evacuations, the two first containing about a pint of loose coagula each, the third being a solid coagulum, about fourteen inches long, and forming a complete mould of the colon. The patient was cold and pulseless; the eyes fixed and glazed; the tongue cold, and the cold dews of death had already descended

upon her. The anæmic state was very marked, including the rare and sighing, almost sobbing, respiration. In this dilemma I gave two teaspoonfuls of brandy, with a few drops of spt. ammon. co., rapidly followed by a scruple of the acetate of lead. In the meantime I had prepared a small starch enema, with a half-drachm of the acetate. Within less than half an hour the next coagulum passed, and I immediately administered the enema, and gave the second scruple of the acetate. One hour afterwards I gave a third scruple, and I had the happiness to see my patient convalesce without further hemorrhage, without any unpleasant symptom, and I can add that she is now alive, and a most useful member of society.

Later in the same year I was called upon to advise for an old soldier of the Coldstream Guards. This poor fellow passed daily large sphacelated portions of the colon and rectum, the mutilated intestine protruding through the anus in large gangrenous shreds, like the fingers of a glove. He had been treated with mercury, and finally with large doses of crude opium, without the smallest relief. Here eight grains of the acetate every three hours acted like a charm, combined with the local use, and I meet the old man now, in my daily walk to the hospital, as hale and hearty as an octogenarian can be.

I have selected these two cases, not as those in which the largest amount of the remedy has been well borne, but as those in which full doses have been followed by the happiest possible effects; indeed, during twenty-one years' ample experience of this remedy, I have never witnessed a single untoward symptom from its therapeutic use.

I have stated above that such has been the universal effect of the remedy "*in my hands*," and I did so for this especial reason:—During the endemic of 1837, several of my professional brethren, hearing of my successful mode of dealing with it, inquired the particulars. The remedy came into general use, but produced such irritating and unfavourable symptoms, in doses of *one or two grains*, the limit to which it was then judged safe to restrict it, that it was, after a short and unfair trial, abandoned.

The only point on which I presume to differ from my old and excellent friend, Mr. Sweeting, is this—that of combination. In accordance with the practice of Dr. Christison, and the rule laid down by the late Dr. A. T. Thomson, of University College, I always give acetate of lead in a fluid form; *never* without acetic acid, and very rarely indeed without Battley's liq. opii sedativ. My large hospital and other opportunities have enabled me to test the relative value of lead and opium, separately and conjointly. The result has, *cæteris paribus*, determined me in favour of the combination.—*Prov. Med. and Surg. Journal, June* 25, 1851, *p.* 357.

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55.—*Use of Belladonna in Lead Colic.*—The following plan is adopted by M. Malherbe, in the belladonna treatment: on the first day, five *centigrammes* of the extract, with ten *centigrammes* of the powder of the root. When the first dose is without effect, that is to say, when neither the pains nor the constipation have diminished, the second is composed of ten centigrammes of extract of belladonna with twenty of the powder. At last M. Malherbe has gone as far as twenty centigrammes of extract, with forty of the powder; but he has not carried the dose farther. With this treatment the greater number of patients have been relieved, from the first to the third day; in the cases in which the symptoms offered a great resistance, and could not be subdued by opium, belladonna has triumphed. Belladonna is considered by M. Malherbe as an antispasmodic and anticonstipant.—*London Journal of Medicine, Aug.* 1851, *p.* 721.

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56.—*Efficacy of the Male Fern in Tænia.*—By W. Cowen, Esq., Kidderminster. —[Mr. Cowen is another witness to the efficacy of the power of the oil of the male fern. His connection with the Kidderminster Infirmary has given him frequent opportunities of witnessing its efficacy, and he records the following *case as one* of many such instances.]

John Pearsall, age 46, weaver, states that sixteen years ago, he first discovered that he was subject to worms. From that period to the present time, this affliction has gradually increased, until he has become, from their constant irritation and annoyance, emaciated, nervous, and care-worn. He says that he has been treated by numerous medical men with more or less benefit, and has taken so much turpentine that he had rather remain as he is than take any more, although the worms often come from him as he walks.

April 7th.—Ordered him to abstain from supper that night, and take primo mane olei filicis maris, 3j.; to be followed in an hour afterwards by olei ricini, ℥j.

8th.—Brought with him a large tape-worm, perfectly entire, and of great length, which he says he passed in about an hour after taking the castor oil.

15th.—To ascertain if more worms existed, I gave him another dose as before, but, although it acted briskly on his bowels, no trace of any worm could be perceived.

29th.—Called on him to-day to know if he had passed any more worms since last I saw him, and he assures me he has not; neither has he been troubled with these uneasy sensations which formerly so plagued him. He has improved in looks, and is gaining flesh.—*Med. Times, Sept.* 13, 1851, *p.* 282.

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## 57.—ON KOUSSO IN CASES OF TAPE-WORM.

By Dr. Barclay.

[It seems that kousso is not the infallible remedy in cases of tape-worm which has been asserted. It is probably as successful or more so than any medicine which has been tried; but the following report by Dr. Barclay will show that it is not always successful in bringing away the *head* of the worm, and, without doing this, we might as well do nothing at all.]

On Wednesday, 10th September, 1851, Dr. Wilson admitted three patients into this hospital with tape-worm, each of which proved to be examples of the tænia solium. One man, John G., aged 31, was immediately recognised as the first patient who had ever taken kousso in this hospital, and that so recently as the month of June last. He then stated, that he had suffered from dyspepsia and sinking sensations at the epigastrium for four years, and that he had begun to pass portions of tape-worm about eighteen months before; that various remedies had been employed, and that he had been admitted into King's College Hospital in February, when kousso was administered with the effect of bringing away a very long worm, (he said thirty-seven feet.) He had been already passing joints of the worm two months before he was admitted in the middle of June. A dose of the patent kousso was now administered, and a very long portion of the worm was again discharged, an exact measurement of which was not made. He began again to pass joints of the worm, two days before his admission. Savory and Moore's preparation was tried on the present occasion, and with the effect of discharging a worm thirteen feet long; but the head still remains behind, or at least was not observed among the evacuations.

John A., aged 21, was admitted the same day; he stated that he had first passed tape-worm a year and a half ago; that eleven weeks since he had taken kousso, with the effect of passing seventeen or eighteen feet of worm; and had felt comfortable and began to pick up flesh immediately after, and had continued to improve till three weeks ago, when his dyspeptic symptoms returned on him, and he was now again passing joints of the worm. A dose of the same preparation of kousso was administered, followed by a black draught, as there was no action of the bowels during several hours after, when only a few detached fragments were passed. Some days having then elapsed, in which the bowels were freely acted upon without any more portions of the worm passing by stool, a second dose of the same preparation was given on the morning of the 18th, which was followed by the evacuation of between two and three yards of tape-worm, chiefly in broken fragments, of which some portions presented very fine joints; but the head was not found. It seems useless to prosecute the attempt further, to bring away any further portion of the animal; and now, in order to restore the tone of the system generally, steel has been ordered.

The third case is that of a girl, Harriet W., aged 17, who has been suffering from feelings of sinking and general weakness since April, and in May had passed about three yards of tape-worm, after a dose of turpentine and castor-oil, which was prescribed in consequence of detached joints having been observed in the stools. She had felt rather better, and seen no more of the parasite until last month, during which her dyspeptic symptoms had been aggravated, and she had observed portions of various sizes in the evacuations. After a dose of the same preparation of kousso, she passed several broken fragments of tape-worm, altogether not measuring much more than a yard, among which no portions were found that approached to the head of the animal.

She seemed a person of nervous temperament, and the menstrual periods were irregular; but she began almost immediately after to complain of headache. The face was flushed, and the tongue whitish, and the pulse quick; her head was much relieved by assuming the recumbent position. A saline draught had been prescribed, her general health was much improved, and it was thought better to defer any further attempt to expel the tape-worm for the present.

There can scarcely remain a doubt in the mind of any candid inquirer that kousso is equally liable to failure with other anthelmintics in expelling the tænia solium. Neither can it be alleged that the patent preparation is more efficacious than that supplied by Savory and Moore, because, not only are we certain that the first patient took the former in June, but, from the date, it is almost certain that he took it also in February, and on the third occasion the joints were so fine that it required care to ascertain positively that the head was not attached. This was, by careful examination, placed beyond a doubt, and, unless perchance it may have been passed in a separate and detached portion which had been lost, it is extremely probable that this creature, with its extraordinary rapidity of growth, will have reached the length of some yards again in a few months.

Another advantage was said to be obtained by the use of the kousso, that it acted as a direct poison to the animal, and there was consequently the more certainty of its being expelled after its death than when the expulsion was merely due to a purgative action on the bowels; but this is also disapproved, both by the circumstance that a portion has been twice left behind, which has grown again, and also by the circumstance observed in more than one of the above instances, that the detached joints continued to move for some time after their expulsion, following on a dose of the kousso.—*Med. Times, October* 18, 1851, *p.* 408.

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## DISEASES OF THE URINARY ORGANS.

### 58.—ON SOME OF THE PATHOLOGICAL INDICATIONS OF THE URINE.

By Dr. G. Owen Rees, F.R.S., &c.

[The urine, in a state of disease, must be regarded in three points of view, as bearing upon its pathological indications. We must bear in mind, that as it is presented to us, urine has passed after its secretion from the kidneys over a lengthened surface of mucous membrane, and hence its abnormal properties may consist either in an unhealthy action of the chylopoietic organs of the kidneys themselves, or of the passages over which it has flowed. Diabetes may be taken as the type of fault in the chylopoietic organs; albuminuria as from a diseased condition of the kidney; while cystitis may be looked to as an example of the changes produced upon the urine by diseases of the urinary mucous membrane, and to certain forms of alkaline and purulent urine unconnected with lesion of the secerning structure of the kidney.]

The indications of the urine consequent upon chylopoietic disease, and also those caused by disease of the secreting portion of the kidney, are often simulated by the indications afforded when the mucous surfaces over which the urine flows are alone in fault; the urine being secreted in a healthy state by the kidneys, but being discharged from the urethra greatly altered from its healthy condition. Let *us take as* an instance of this a form of phosphatic urinary deposit which occasion-

ally appears as indicative of dyspepsia,—the monobasic triple phosphate. An alkaline or neutral urine depositing these crystals may pass from the urethra simply in consequence of the existence of irritation of the mucous surfaces of the kidney, ureters, or bladder, but may have been secreted quite healthy, and of its normal degree of acidity, by the secreting portion of the kidneys. Again, the urine may contain albumen in consequence of disease of the bladder or ureters, causing purulent secretion, while the kidneys may be healthy, and the urine thus vary from its normal character only after it has left the pelvis of the organ. Here, on the one hand, the urinary indications might be considered indicative of dyspeptic mal-assimilation, or on the other, of important change in the kidney, whereas the whole mischief might lie in inflammatory disease of the mucous surfaces over which the urine flows after it has left the cortical portion of the organs. It is often, then, highly important, when any abnormal condition is detected in the urine, to ascertain by careful examination, and notice of other symptoms, how far the change from health has been brought by the influence of the mucous surfaces.

[What action do the mucous surfaces exert upon the kidney? what do they add to the secretion? and in what way do they modify its character? In health, the urine receives from it epithelium in small proportions, more or less altered in form, and mucous corpuscles. These are found in all urine, and may be easily seen as a cloudy deposit by a bright transmitted light. Although protection to the mucous membrane is one of the uses of mucus, it has besides a chemical quality, which is valuable, and perhaps too little regarded, viz. its alkalinity.]

Now, healthy urine is nearly always acid, and this amount of acidity is constantly varying, the secretion becoming at one time neutral, or even alkaline, and at others far above the average degree of acidity. This points to the necessity for a mucous surface capable of pouring out its alkaline secretion freely, and, if necessary, suddenly and in large quantity, and this always happens when irritation is set up, or inflammation produced, in the mucous membrane.

You are all familiar with the secretion which flows from the nose at the commencement of catarrh, and also from the bronchi in some inflammatory conditions. This is a watery secretion from the mucous membrane, and it possesses a strongly alkaline reaction. The discharge will amount to as much as several pints in the course of the twenty-four hours in some cases of bronchitis. In like manner the mucous membrane of the bladder will throw off under irritation an alkaline fluid more or less clear and watery.

I had occasion some five or six years ago to observe this in the case of a man whose anterior abdominal parietes were deficient. As is usually the case in such persons, the anterior portion of the bladder was also wanting; so that the fundus of that viscus, covered by mucous membrane was projected forward where the abdominal walls were deficient. The openings of the ureters were thus presented to view. The mucous membrane was red and inflamed from exposure, and an alkaline fluid was constantly discharging from its surface. To what this alkaline flux amounted during the day, it was, of course, impossible to ascertain; but it was more than sufficient to destroy the acidity of the urine, which was quite alkaline after flowing over the membrane. Thus, if a piece of blue litmus paper was applied to the openings of the ureters so as to test the urine, immediately it flowed from them the paper was reddened, indicating that the urine was secreted of its natural character, and with its full amount of acidity. When, however, the litmus paper was applied about a quarter of an inch below the opening, so as to test the urine after it had passed over that short distance of mucous surface, its characters were quite changed; it no longer reddened the blue litmus paper, but, on the contrary, was sufficiently alkaline to restore the blue colour to those parts of the paper which had been previously reddened by exposure to the urine as it escaped fresh from the ureters. Let us apply this experiment in considering the pathology of alkaline urine, and we must at once admit that disease of the mucous surface is a sufficient cause for the production of this indication.

With respect to alkaline urine generally, it may be stated that whenever it is excreted it is attributable to one of the following conditions:—

1. Disease of the spine from injury or other cause.
2. Dyspepsia.
3. Disease of the urinary mucous membrane.

And 4. The ingestion of medicines, or of aliments containing alkaline salts or salts of vegetable acids.

A fifth—viz., the discharge of an excess of soda, or potassa, or ammonia, from constitutional causes—is mentioned by Dr. Prout. This, however, I am now satisfied must be regarded as produced by aggravated disease of the mucous surfaces, and therefore should be included under the third heading.

I will proceed to consider these conditions seriatim.

First, then, when disease attacks the spinal column, the cord becoming subsequently affected; or when, from external violence, the nervous centre suffers immediate injury, the urine will become alkaline. Various theories have been resorted to in order to explain this. That the secretion of the kidney may become changed owing to disease in the neighbourhood of those nerves of organic life from which it derives its energy, no one will be prepared to deny; this may possibly happen; but there is much to lead us to suspect that another cause than this has the principal share in bringing about an alkaline condition of the urine. I allude to an increased action of the mucous surface, probably brought about in order to protect the ureters and bladder as much as possible during the passage of acid urine over them. The membrane which in its healthy state could bear the stimulus of the healthy urine has now partly lost its vitality, and an alkaline fluid is secreted for its defence. The view I have here taken is strongly borne out by what we observe in all affections of the spinal column terminating in disease of the medulla spinalis and its membranes. The urine first becomes alkaline; as the disease advances, large quantities of mucus appear; and post-mortem examination of the urinary organs will show an aggravated disease of the mucous membrane lining the pelvis of the kidneys, the ureters, and bladder.

[With regard to the relation here shown of alkaline urine to spinal injury, Dr. Rees points to the propriety of using *alkaline* and demulcent remedies in such cases for the relief of the urinary symptoms.]

Secondly, with respect to the alkaline condition of urine caused by certain forms of dyspepsia. This, which is accompanied with the deposit of the earthy phosphates, has been regarded by Dr. Prout as indicative of a tendency to the waste of nervous matter, and a general debility of constitution; and it is certainly true that we generally meet with it in those who have been overworked, either mentally or physically. There is a point of view, however, in which this form of urinary disease has not been regarded, but which yet seems to bear strongly on its pathology.

Now the researches of Liebig have shown that the gastric juice in all probability owes its acidity to the same acids as those which enter into the composition of muscular structure—viz., the phosphoric and lactic; and from whatever source these acids may be derived, it is certain that their proportion in the urine is governed by the necessity there may be for their expulsion from, or detention within, the organism for the discharge of the functions of life.

The constitution of the urine is such, that its degree of acidity (taking the whole result of twenty-four hours) may, to a certain extent, be regarded as the measure of the acidity of the stomach, or of the quantity of the phosphoric and lactic acids expelled, and this would seem to point to the deficiency of acidity in the excretion as an indication of disorder of the stomach interfering with the secretion of the gastric juice in its healthy condition. I believe this alone to be the cause of alkaline urine, so far as what are called constitutional causes are concerned; and I do not believe the deposit of phosphates, when it occurs in alkaline urine without disease of the passages, to indicate any thing more than this state of stomach. Under these conditions the urine is, of course, secreted *alkaline by the kidneys*, and is not, as in disease of the passages, *rendered alkaline after secretion*. This alkaline or neutral state may, if you please, be regarded as indicative of nervous action being defective, and secretion of the gastric juice not going on as it should do in consequence. Whatever view we may take, however, we must regard the disease as more immediately the consequence of a mal-secretion on the part of the stomach, probably caused by the circulation of a diseased blood through the structure of the organ.

With regard to the term, "phosphatic diathesis," I do not consider that the deposit of the earthy phosphates is any thing more than an indication that the urine is neutral or alkaline. The deposit of these earthy salts has led to the erroneous idea that they are present in *excess*, and to the adoption of the above term. There

are few diseases, however, in which the earthy phosphates are really present in excess, and these are not allied in any way to the class of cases which come before us as urinary diseases. Thus the urine is often *acid* when large quantities of earthy phosphates are escaping, as in mollities ossium.

I am by no means inclined necessarily to connect alkaline urine with severe nervous irritation, with wasting, and other symptoms of vital decay. Many cases in which we observe the secretion of such urine with phosphatic deposits show no such condition, the debility not exceeding that which characterizes many forms of dyspepsia; while, on the other hand, we often see great depression and loss of vital power, with wasting, as when oxalate of lime appears, and no tendency to alkalinity.

With respect to the treatment of that morbid state of the system which induces the excretion of this kind of alkaline urine, the administration of the mineral acids is by far the most valuable means we possess of restoring the stomach to its healthy function. In many cases this alone will be sufficient, if continued for a few weeks; but in old cases, or where relapse has been frequent, it is highly desirable to have recourse to mild alterative treatment in addition. For this purpose nothing can be better than the use of the bichloride of mercury in small doses, taken at bed-time in the form of draught, and in combination with the tinctures of rhubarb and bark. This will be found greatly to assist the mineral acids in restoring the healthy secretion of the stomach. The bowels should be closely watched in this disease, and their action kept up by warm stimulating purgatives.

I shall now proceed to consider that alkaline condition of urine which is connected with disease of the mucous surfaces lining the kidney and ureters, and in which the urine is secreted acid, but becomes alkaline in consequence of the changes subsequently effected in it. Here in addition to the alkalinity of the urine, we have symptoms not so much characterised by dyspepsia as by irritation of the urinary canals. There are dull pains in the loins, and down the sides of the abdomen, occasional dysuria, and not uncommonly the skin becomes inactive and dry, or subject to occasional excessive excretion. The urine generally contains mucus in excess, and sometimes pus in considerable quantity; and in the older and more aggravated forms of the disease the miseries consequent on calculus in the bladder are often added to other evils.

It has been believed up to the present time that when urine has been secreted acid by the kidney, and has subsequently become alkaline, owing to the action of the mucous surfaces, the cause of the alkalinity consists in the evolution of carbonate of ammonia, produced by the decomposition of urea. The mucus poured out by the mucous membrane has been regarded as a sort of ferment; and by its action carbonate of ammonia has been supposed to be formed by a disturbance in the arrangement of the elements of urea. Now, though it is nearly certain that the urea undergoes this kind of decomposition when the urine is long retained in the bladder or urinary passages, it is highly improbable that such decomposition always takes place in the cases I am speaking of; and I think I shall be able satisfactorily to prove to you that we have no occasion to resort to such mode of explanation. If we take healthy urine of its full acid reaction, and add liquor potassæ to it carefully, we shall find that when we have neutralized its acidity, ammonia is immediately evolved. There is no occasion to use caustic alkali, however; for if we add a solution of basic phosphate of soda instead, which is a very mild form of alkaline solution, we still observe that ammonia is given out in great quantity. If we now test the reaction of this urine, we find that the reddened litmus paper becomes blue, indicating the presence of an alkali; but on drying, it will again assume its red colour, showing that the alkaline reaction was caused by ammonia, and not by fixed alkali; but, it may be asked, how could this happen, since we used *fixed* alkali to produce the alkalinity? The fact is, that our fixed alkali is all neutralized by the acids with which the ammonia was previously combined, and the volatile alkali is set free to exercise its power on the reddened litmus. Thus, supposing the ammonia to have existed as phosphate and hydrochlorate in the urine, the fixed alkali has combined with the phosphoric and hydrochloric acids to form *neutral* salts of the fixed alkali, leaving the ammonia the only free alkali present. So it is that the mucous surface will occasionally act under inflammation: the alkali contained in the mucous secretion is fixed alkali, but its presence produces

free ammonia, while the fixed alkali itself is neutralized to form salts with the acids which were previously combined with the ammonia. This state of things will always be observed when the mucous surface is not pouring out any very large quantities of its alkaline secretion. When, however, there is an excessive discharge of alkaline fluid, then there is a change with regard to the action of reddened litmus, which will now become permanently tinctured blue. No drying will restore its red colour, and we therefore at once observe that fixed alkali effected the change. This has happened owing to the excess of fixed alkaline matter poured out by the mucous membrane having more than neutralized the acids of the ammoniacal salts contained in the urine. All the ammonia has been set free, but the fixed alkali has been secreted in such great quantity as to neutralize both the free acid of the urine and the acids of the ammoniacal salts. I would particularly beg your attention to this circumstance, as important distinctions connected with general pathology have been made in reference to these two conditions; whereas I firmly believe there is no necessary difference whatever *in kind* between the two states, and that they are always merely differences in degree of inflammation of the mucous surface. It is a fact, then, that urine may be rendered fugitively alkaline (that is, alkaline by free ammonia), and also permanently alkaline by the action of the inflamed mucous membrane, and that one or the other state may be induced according as the membrane pours out more or less alkaline fluid. Attempts have been made by systematic writers to draw a distinction between these two conditions, founded on the nature of the phosphatic deposits accompanying them. This has greatly confused the subject; but, if you will only regard the matter as I would now wish to place it before you, I think much of the difficulty will be overcome.

The earthy salts of the urine—viz. the phosphates of lime and magnesia—always appear in the form of urinary deposits when the urine becomes alkaline. When the urine deposited the triple phosphate (or phosphate of ammonia and magnesia), Dr. Prout was inclined to consider the case as somewhat different in kind to that in which both the earthy salts appeared—that is, when the phosphate of lime accompanied the triple phosphate. It will be obvious, from what I have told you concerning the fixed alkaline matter contained in the secretion of the mucous membrane, that, if that alkali be poured out only to such degree as to evolve ammonia, and not to neutralize the whole of the acids of the ammoniacal salts of the urine, the triple or ammoniaco-magnesian phosphate must be thrown down as a deposit. If the alkali be effused by the inflamed membrane in still greater quantity, then it is obvious the phosphate of lime must also fall; the mischief in both cases arising from one and the same cause—viz., inflammation of the mucous surface. Now, if we look to Dr. Prout's work, we shall find the history and symptoms detailed under these heads exactly such as we might expect from varying degrees of inflammation of the urinary canals; and it is a matter of surprise that the power of that membrane in rendering the urine alkaline, and its necessary influence in producing the various phosphatic deposits, has been so much overlooked as it has been by systematic writers. When, then, you observe urine of alkaline reaction, always ascertain whether or not it affects reddened litmus or turmeric paper permanently. If it do not, and the paper reassume its colour on drying, then ammonia has changed it; and you may conclude, with considerable accuracy, that the mucous membrane is not in so inflamed a state as when a permanent effect is produced. In the one case you will generally have the triple phosphate only as a deposit; in the other, you will have the phosphate of lime also. Of course, it is necessary for you here to exclude from your consideration that form of alkaline urine which I have before noticed, and which is *secreted* alkaline, and its characteristic of dyspepsia. I am now merely speaking of alkaline urine as produced by the action of the mucous surfaces. There is seldom, however, much difficulty in making the distinction between these two kinds of urine. That characteristic of general disorder, and which is *secreted* alkaline by the kidney, is very rarely accompanied with more than the normal amount of mucus; whereas urine which is made alkaline by the action of the mucous membrane nearly always contains mucus and epithelium far beyond the quantity observed in health, and very often pus also.

The disease characterised by the deposition of the mixed phosphates (that is to say, both the triple phosphate and phosphate of lime) is very accurately described

by Dr. Prout. He states that it seldom occurs without severe and old disease of the bladder and prostate, which, you will observe, is precisely the condition that would favour the discharge of large quantities of fluid from the mucous surface, and so bring about an alkaline urine, such as would permanently affect the test paper.

I must now direct your attention to that state of urine which has been described by Dr. Prout as consisting in an excessive excretion of the alkalies. This affection, which that great authority was inclined to consider peculiar in character, was observed by him only in very advanced cases of disease, where the bladder and mucous passages had suffered greatly, or where calculus or what he called long-continued phosphatic diathesis had greatly lowered the patient. From what I have already urged upon your attention, I think you will now be prepared to believe that a very simple explanation may be given of this condition. I have already alluded to two states of the urinary mucous surfaces: in one of them the fixed alkaline fluid was poured out merely in quantity sufficient to liberate a part of the ammonia from the ammoniacal salts; in the second, the fixed alkaline fluid from the mucous membrane overcame the acids entirely, and communicated a permanent alkalinity to the urine when secreted. The first of these conditions was accompanied chiefly by a deposit of the triple phosphate; the second, by both the triple phosphate and the phosphate of lime. Now when long-continued or aggravated disease, such as Dr. Prout has so well described, affects the urinary passages and bladder, and a condition of urine is produced in which ammonia and soda (and, as he states, probably potassa) are found in excess in urine, the cause of the presence of these constituents appears very plainly indicated. I believe, then, that this condition is again produced merely by an inflammation of the urinary mucous surfaces connected with a more excessive discharge of their alkaline secretion; and that it is the constituents of this which, by their presence in such excess, decompose the ammoniacal salts, throw down precipitates of the earthy matters, and, becoming free, produce the form of urine described by Dr. Prout. I in no way believe the disease to be caused by any peculiar state of system.

It will be observed that I have here extended the importance of the alkaline secretion of the urinary mucous surface to a degree which has not yet been accorded to it. I would wish to state, however, that I have only done so after very mature consideration, and a full persuasion of the very satisfactory manner in which this view explains and simplifies the subject. The discharge from an inflamed mucous surface, when we have the opportunity of exactly estimating it, we all know to amount to a very large quantity per diem. This discharge is a fertile source of alkali; and there can be no possible reason why the urinary mucous membrane should be exempted from liability to excessive secretion any more than the lining membrane of the bronchi or nares. It is, as I have before said, constantly exposed to the action of a fluid which is varying in its degree of acidity, and which is affected by the character of the ingesta; and there is no occasion that I should explain how or why it is that, in our civilized state, those ingesta are most irregularly supplied to the stomach, both in quantity and quality; or how we too often find the members of our enlightened community paying dearly, through their urinary organs, for those physical as well as intellectual delights which are to be obtained at the dinner-tables of the more elegant and refined of the age. There is, perhaps, no mucous surface more harshly dealt with than that lining the kidneys, ureters, and bladder, and none which has been less reasoned upon by pathologists.

You will observe that I have taken especially into consideration the action which the fixed alkali poured out must exercise on the ammoniacal salts of the urine; whereas the production of ammonia in urinary disease has been previously ascribed to the decomposition of urea only. I by no means, however, entirely disregard this last-mentioned source of the alkali; it is well known, indeed, that some portion of urea is always decomposed when brought in contact with fixed alkaline solutions.

The analogy to which I have pointed, in comparing the secretion of the urinary mucous surface under inflammation with the products of other mucous membranes in the same condition, may not at first appear quite satisfactory. It might be very plausibly argued that the condition of membrane under which the greatest amount

of secretion was poured out was not necessarily that of highest inflammation; and from what we know with respect to bronchitis, it must be acceded that, when the secretion is produced very alkaline, and very fluid, and in very large quantity, we do not always find that inflammation runs highest. It is under this impression that I would rather apply the word irritation, when speaking of these varying amounts of secretion, believing, as I do, that it more correctly expresses the real and immediate condition. Thus, when the system is broken down by old and long-continued disease, it is then we observe the presence of the fixed alkalies in excess in the urine; or, in other words, we have then large quantities of the mucous fluid poured out; and it is this kind of excessive discharge which is produced in the bronchial tubes when the patient shows no great power of system, where irritability exists, and where inflammatory action is marked by that degree of atony which the practitioner recognises in the term "subacute inflammation."

With respect to the treatment of these cases of alkaline urine, it must be of a very different kind from that which is applicable to the cure of alkalinity of the urine when caused by stomach derangement. The pathology of the subject must be regarded, and the alkalinity combated by directing treatment to the irritated mucous surfaces. We must remember that the urine is secreted acid, and our object must be to make it less irritating. The acid remedies which are useful, therefore, in that form of alkaline urine dependent on constitutional causes, are here most improper; and we must meet these diseased conditions by the exhibition of alkalies. The urine as it is secreted in the kidney, must be rendered alkaline, and so less irritating; and while we do this, attention must be paid to the state of the secretions generally, and especially to that of the skin,—a much neglected excretory surface, but which should never be forgotten in considerations connected with urinary pathology.

I am well aware that, in the case of the excretion of alkaline urine such as I here describe, high authorities have recommended the use of acid remedies. I entirely differ from this view; I believe it to be inconsistent with sound pathology, and experience has shown me the advantage of the opposite plan of treatment.

With respect to the best means of rendering the urine alkaline and less irritating in this disease, I would recommend the use of salts of vegetable acids: the citrate of soda or potassa, as exhibited in ordinary saline draughts, is an excellent salt for the purpose. This is more especially to be used when it is not desirable to risk purging the patient; when, on the other hand, we find it requisite to produce such effect, the tartrate of potassa may either be substituted, or combined with the citrate.

The vegetable acids are decomposed in the organism, and the base with which they were combined appears in the urine as a carbonate. If the state of the bowels be such as to require purging, there is no better remedy than the ordinary Seidlitz powder of the shops—a combination of soda and potassa with the tartaric acid which rarely fails to induce an alkaline state of the urine, and thus soothe the irritation of the canal. This treatment, if combined with the use of vegetable tonics, will be found sufficient in early cases. Where, however, we have to deal with cases in which there is evidence of old and long-continued disease, we must not trust to this treatment alone. We may here expect that thickened state of the submucous cellular tissue consequent on inflammatory action; and we must have recourse to mild alteratives and sedatives, and remedies such as will assist the skin to assume a more than ordinary action for the relief of the kidneys; hydrargyrum cum cretâ and Dover's powder, in small doses taken at night, may be here used with great advantage. Care must be taken, however, to watch the effects of the mercury—to ensure, in fact, its alterative action, and to avoid alike both purging and salivation. In the cases Dr. Prout has described as characterised by the presence of the alkalies in excess, mercury is nearly always inadmissible; the patient is generally too far debilitated to admit of its exhibition with any degree of safety, and support, antacids, and sedatives, are all we dare venture upon.

In all these conditions a great amount of relief may be obtained by the use of warm bathing, if it be judiciously applied. In advanced cases the debility is generally too great to admit of it; but wherever the strength allows it, the use of warm or tepid baths, and of friction to the skin, are valuable means of relieving the patient.

An excellent method of rendering the urine less acid and irritating in all these forms of disease consists in the administration of the liquor potassæ. This is, indeed, the old established and favourite remedy which experience has proved; I have constantly used it, and in some cases it is an extremely efficacious and convenient form of alkali. Owing, however, to the small quantity of potassa which we may venture to exhibit in the caustic state, the urine is not rendered alkaline by this remedy so speedily as when the tartrate and citrate of the base are used. I must here state a fact which has been brought to light by this mode of treatment, and which places it beyond doubt that the urine is secreted *acid* in these cases of *alkaline* urine. Now, if we begin in the early stage to exhibit small doses of liquor potassæ,—say from 15 to 20 minims, three times a day,—we shall occasionally find that, while this *alkali* is being exhibited, the urine which was alkaline will become *acid*.

You are now prepared to understand how this may happen. If we lessen the acidity of the urine as it is secreted on the mucous surface, and thereby rendering it less irritating, that surface will in time recover itself, and no longer pour out that fluid, which is the result of inflammation. The urine will after a time pass over it without producing irritation, and the result will be that acid urine is voided, its natural acidity being only partially neutralized by the small dose of liquor potassæ. I perceive this to be the only satisfactory explanation of the fact, so anomalous at a first view, that *alkaline* urine may be rendered acid during the administration of an *alkaline* remedy.

I will now say a few words respecting the last heading,—namely, that which refers to the alkaline state of the urine produced by the ingestion of medicines, or of aliments containing salts of vegetable acids.

I need not here stop to consider the effects of the pure or carbonated alkalies, when used medicinally; and I have already explained that the medicinal alkaline vegetable salts are decomposed in the organism, so as to afford carbonates of their bases in the urine. I must, however, refer to the effects of some articles of diet which are occasionally capable of rendering the urine alkaline, and which, therefore, may perhaps occasionally produce some anxiety amongst those who are morbidly inquisitive and sensitive as to the state of the secretion.

It will be obvious that, since it is our object to render the urine alkaline and less irritating, as it is secreted by the kidney, in those cases of alkaline urine which are dependent on irritation of the mucous surfaces, those ingesta which produce the alkaline condition must to a certain extent assist us in treatment. This state of things is brought about by the digestion of all sub-acid fruits. It was remarked by Rousseau, who suffered from calculous disease, that he always got relief during the strawberry season, the fruit exercising a favourable influence on his symptoms. This result was brought about by the conversion of the acids into carbonic acid and water; the base with which they were combined passing into the urine in the form of carbonate. But it is not only sub-acid fruits which effect this: potatoes taken in quantity will produce a similar result, and thus an excess of that vegetable may become a cause of alkaline urine. I ascertained this fact by experiment, some two or three years ago, on a gigantic Irishman, whose stomach was capable of receiving, if not digesting, seven pounds of potatoes at a meal. Potatoes contain alkaline salts of both the citric and malic acids, and it is to these they owe the property of rendering the urine alkaline. Sub-acid wines, especially champagne, taken in quantity, are also capable of producing alkaline urine. It is important you should be aware of this, as alkalinity may be looked upon as a sign of rapid decay of vital power in cases of extreme debility or exhaustion after operations, whereas it may be owing merely to the support we are affording the patient in the form of champagne. I have known this to occur, and it produced some anxiety until the real cause of the alkalinity was detected. A glass of champagne every four hours exhibited to a person worn by disease, and whose stomach refuses solid aliment, will generally render the urine alkaline in twenty-four hours.—*Med. Gazette, July* 4, 1851, *p.* 29.

## 59.—REMARKS ON ACID AND ALKALINE URINE.

By Dr. H. Bence Jones, F.R.S., &c.

One of the most remarkable characteristics of urine is the re-action which it always presents to test-paper. If the whole quantity of urine passed in the twenty-four hours be collected and examined, it will give an acid reaction. If the water passed at different hours of the day is examined, then the degree of acidity will be found to be always changing. So that there is no one constant permanent degree of acidity of the urine. It is as varying as is the state of the acidity of the stomach. It may be said, generally, two, three, or more hours after food is taken, the quantity of acid in the stomach attains its greatest height. The food then begins to be absorbed, or to pass out through the pylorus, when the acid begins to diminish, until the stomach is again empty, when it returns to a neutral or a slightly alkaline state.

In the 'Philosophical Transactions' for 1849, Part II., you will see some elaborate diagrams, showing the effects of different diets on the acidity of the urine, —different lines, showing respectively the effect of animal food, vegetable food, mixed diet, and abstinence from all food. From the time when food is taken, the acidity of the urine begins to descend; and after two, three, or more hours, the acidity is at its lowest point. Thus, at the time when the acidity of the stomach is at its highest, the acidity of the urine is at its lowest point. Frequently, indeed, the acidity of the urine is so low, that it passes the neutral state, and becomes distinctly alkaline; and this may occur in healthy persons, whose stomachs are slightly irritable; certainly it does occur in those who are not subject to any disease which seriously interferes with the process of digestion. After two or three hours it is found that the acidity of the urine again increases, arising at first rapidly, then more slowly, until the period when food is again taken, when it again begins to fall. Thus you will see that, as regards acidity, there is an inverse relation between the state of the stomach and the state of the urine. I have shown you the acid reaction of the gastric juice after food has been taken; now let me show you the reaction of the urine as regards acidity, before and after food. I have here four different specimens of urine, passed at different periods of the day. The first was passed just before food, and on examination, it will give a decidedly acid reaction: it was passed just before breakfast, by a healthy person. Here is the next specimen, passed three hours after breakfast was taken; you see that there is scarcely any acid reaction; it was passed by the same person. The third specimen was passed two hours after the second; and you see the acidity distinctly returning. The fourth specimen was passed two hours later than the third, and the acidity is very much more evident,—closely approximating, indeed, to that of the first specimen. (Experiment with test-paper). The mode that I have adopted for marking these variations of the acidity of the urine, (for the test-paper is not sufficient to determine the actual degree of these variations,) is the following: I have here a tube, graduated into a hundred measures. Pure carbonate of soda is dissolved in so much water, that every measure of this tube contains the twelfth of a grain of carbonate of soda. This forms a test alkali. I have a test acid prepared in a similar way, one measure of the tube containing as much acid as will saturate the twelfth of a grain of carbonate of soda. I then take 1000 gr. bottle and weigh the bottle full of urine, and pour it into a little basin, adding the test alkali or acid, while the basin is constantly stirred and gently heated, until I bring it to the point of neutrality. Thus the number of measures of test alkali required to effect the neutralization, gives the quantity of carbonate of soda which will neutralize the acidity of the urine. I find that this is usually much greater in urine passed just before food than in that passed two or three hours after food. I find even, sometimes, that test acid has to be added to the urine which is passed after food, to bring it back to the neutral state. By this method we obtain a sufficiently exact measure of the alkalescence or the acidity of the urine; and it is thus tables may be constructed:—

(No. 1.) *Variations of Uric Acid and Acidity.*

| Mixed Diet. | Specific Gravity. | Per 1000 grs. Urine Uric Acid. | Per 1000 grs. Urine Acidity. |
|---|---|---|---|
| Urine at 2 p.m. | 1025·0 | 0·52 grs. | 13·07 meas. |
| Dinner at 7 „ | 1025·7 | 0·12 „ | 26·12 „ |
| 11 „ | 1026·7 | 0·62 „ | 13·81 „ |
| Vegetable Food. | | | |
| at 2 p.m. | 1021·6 | 0·56 „ | 8·29 „ |
| Dinner at 6½ „ | 1024·0 | 0·05 „ | 26·36 „ |
| 10½ „ | 1026·2 | 0·64 „ | 3·29 „ |
| 6½ a.m. | 1034·2 | 0·66 „ | 19·52 „ |
| Animal Food. | | | |
| 2½ p.m. | 1022·7 | 0·24 „ | 7·82 „ |
| Dinner at 6½ „ | 1024·8 | 0·05 „ | 21·46 „ |
| 11½ „ | 1029·9 | 0·77 „ | 16·50 „ |

My table, in the third column, represents the number of measures of test alkali required to neutralize 1000 grains of urine passed at different times, and when various diets were taken. I was induced to follow out these variations, from observing the action of the urine on test paper, in urine precisely similar to that which you have seen me test a few minutes since. Before breakfast, the reaction was highly acid, while in the water passed after breakfast, the reaction was alkaline; and in a few hours afterwards the secretion was highly acid again. I found, that by making careful examinations, the same variations followed, meal after meal, day after day, and for days together.

To determine whether these variations in the acidity of the urine were really caused by variations in the acidity of the stomach was not difficult, for this reason: if these changes depended on the state of the stomach, it was very clear that, by allowing the stomach to remain unacted upon by food, provided no acid was secreted in the stomach, no great variation in the acidity of the urine ought to be found. During fasting, none of those changes which are apparent in the urine when food is taken, ought to occur. Thus, by simply abstaining from food, I tested whether the variations of the acidity of the urine were really produced by the variations of the acidity of the stomach or not.

It was found that, when perfect abstinence was observed, scarcely any change took place in the acidity of the urine, when the specific gravity of the urine was not materially changed. After ten or twelve hours, food was taken, and instantly the acidity of the urine fell, and, in the course of a short time, was below the neutral line. No more accurate test of the influence of the stomach could be applied than this. Nothing can be more evident than the intimate relation which exists between the state of the stomach and the state of the urine.

Let me point out one or two other results which I obtained when examining the variations in the acidity of the urine after different kinds of food were taken. I found (contrary to what might have been supposed) that, when animal food alone was taken, the quantity of test acid required to render the urine neutral after such food, was greater than when vegetable food was taken; that is to say, that the acidity of the urine after animal food, is less than after vegetable food. Supposing it to be true, that at any one period of the day the acidity of the stomach is inversely proportioned to the acidity of the urine, this would show that vegetable food does not cause so much acid to be thrown into the stomach, as is caused when animal food is taken. I have mentioned, that the acidity of the gastric juice is the effective agent in dissolving albuminous food; perhaps a less remote cause may be found in the following statement:—When food is taken into the stomach, the acid is poured out there. Of this acid I have already spoken, and have shown you that some portions of it consist of hydrochloric acid, and, probably, of phosphoric acid. If hydrochloric acid and phosphoric acid are set free in the stomach, there must be some decomposition of chloride of sodium or phosphate of soda. If acid is poured out in the stomach, alkali must be set free somewhere else; and it seems to me most probable, that the hydrochloric acid is set free in the stomach, whilst the soda (the alkali) remains in the blood; so that, during digestion, the blood is more alkaline than it is at other periods. If the blood is in a more alkaline state, then the secretions which take place from

that blood ought at that time to become more alkaline. You will remember, in my lecture on the saliva, I mentioned, that Dr. Wright, of Birmingham, observed, that the saliva was more alkaline during digestion than at other times. So, also, according to my own experiments the urine is at this time more alkaline than at other times; so much so, that sometimes during digestion, the urine is so alkaline that it requires as much as 30 measures of the acid solution, equivalent to 2½ grains of carbonate of soda, to render 1000 grains of urine neutral.

Having satisfied myself as to the variations in the acidity of the urine, it became an interesting point to determine what was the effect of different medicines. But my time will not permit me to enter fully into this subject. I must refer you to the two papers in the 'Philosophical Transactions,'—one in 1849, and the other in 1850—which give the results of experiments during one day on which no medicine was taken, three days on which the medicine was tried, and then a fifth day on which no medicine was taken. Thus, by means of these five days' experiments, I have attained a pretty tolerable certainty regarding the effect of different medicines upon the acidity of the urine. I may say, that the medicines that were tried were sulphuric acid and tartaric acid; and, to see the effect of alkalies, caustic potash, carbonate of ammonia, tartrate of potash, and tartrate of ammonia were made use of. These substances were prepared with considerable care, so as to insure that there should be no interference in consequence of any impurity being present in them. The most interesting result of all, and the only one on which I shall now dwell, was the comparative effect of tartrate of potash and tartrate of ammonia. It was well known, and stated by many authors long before I commenced these experiments, that tartrate of potash caused the urine to be alkaline. I found that it did so; but I found that it caused it in a different way from what had been stated by the authors who had made experiments on the subject.

[Dr. Bence Jones here introduces a table showing the variations in the acidity of urine when tartrate of potash and tartrate of ammonia were given; and then goes on to say:]

The undotted line in my woodcut represents the effect of tartrate of potash, and at first sight it is evident that the line which represents the state of the urine is much lower than that which marks the variation when tartrate of ammonia was taken. Let us trace this undotted line a little closer. It commences about breakfast time, soon after which it passes the neutral line, showing that the urine then was alkaline; about two it rises, recrosses the line, and then, when the urine had become acid, a dose of five drachms of tartrate of potash was taken, and almost immediately the line descends in consequence of the urine becoming alkaline again. It does not remain so for any length of time, for very rapidly the line descends to its lowest point, and then rises again above the neutral line, and ascends almost as high as it would have done if no tartrate of potash had been taken. You might suppose from this, that the effect on the urine was ended; but it is not; for look at the undotted line. When dinner was taken the highest point had then been reached, for after food the line descends, and it reaches a point some hours after food far lower than it probably would have reached if no tartrate of potash had been taken. Thus, it may be said, the tartrate of potash does not interfere with the variations produced by the state of the stomach, except that a short time after it is taken it renders the urine alkaline, and that the effect of the tartrate of potash becomes again apparent when it afterwards acts with the state of the stomach; then it renders the urine more alkaline than it otherwise would have been. I repeated the experiment on the succeeding day with three drachms of tartrate of potash, the effect of the previous dose still continuing. After breakfast, the line marks the alkalescence of the urine. By twelve o'clock the acidity rose, and reached by two o'clock to a high degree. Then the three drachms of tartrate of potash were taken,—a smaller dose than before,—but almost immediately the urine became alkaline again. But this was not permanent, for the acidity soon began to rise again, until dinner was taken; then the medicine again showed its effect when it was acting in conjunction with the alkali left in the blood, by the acid going, for the purpose of digestion, to the stomach. On the third day, a repetition of the tartrate of potash caused the same alternation to take place, though the dose then was two drachms. I

found that 120 grains of tartrate of potash caused an immediate effect on the acidity of the urine, rendering it alkaline in thirty-five minutes; but that this first effect passed away quickly. This accounts for the statement made by one author, that tartrate of potash does not make the urine alkaline. The real fact is, that the first effect lasts only for a short time, and that you must look for its greatest effect when it is acting in conjunction with, and not in opposition to, the state of the stomach,—in other words, the effect of the tartrate of potash will be greatest when acid is secreted in the stomach, and the effect will be least when the acid is passing out of the stomach; and it is not improbable, that then it might be altogether overlooked.

Having traced the effect of tartrate of potash, look at the dotted line, which shows the effect of tartrate of ammonia. The first day two drachms were taken; the second day nearly four drachms; the third day three drachms; so that about ten drachms were taken in the three days. The quantity was nearly the same as in the experiments with tartrate of potash; but the ammonia salt did not affect the urine in the same way as the potash salt did. However large the dose, I could not make the urine alkaline; the variations in the acidity of the urine proceeding as if no medicine had been taken, with this exception, that the acidity appeared to be increased by the tartrate of ammonia. From this result, it appeared to me highly probable that even tartrate of ammonia was oxidised. I have already shown you that this conjecture was confirmed, by my finding nitrous acid in the urine when tartrate of ammonia or other salts of ammonia were taken into the stomach.

Thus much for the variations of the acidity of the urine. This will enable me to bring before you the chief object of this lecture, which is to show why it is that the red deposits in the urine take place so copiously. The most frequent form is that which you see in the specimens in the two bottles before you, which are rendered thick by it. This deposit quickly dissolves on the application of heat. It consists of urate of ammonia, and very frequently, probably, of urate of soda. It occurs so frequently with almost every one, that it cannot be considered as a sign of disease, nor even of indigestion. While the urine is warm at the temperature of the body, the deposit is held in solution; and, as I said, it can be at any time re-dissolved by the application of heat. There are two other causes, in addition to the decrease of temperature, which effect this deposit; and, unless these are recognized, you cannot account for those strange variations which are apt to occur in all people. I have here three specimens of urine, passed at different periods of the day; first, just before breakfast; second, after breakfast; third, much longer after breakfast. The first is thick, the next is clear, and the third thick again. Your first supposition would probably be, that the thick specimens contained more of the matter which forms the deposit than the clear one; but you would be totally wrong in judging by the eye as to the quantity present. For example: the first specimen contains a deposit of urate of ammonia, and the second specimen is quite clear, free from deposit. Now, if you were right in your judgment, I ought to find, in determining the amount of urates by the balance, that the first specimen contains much of this substance, whilst the second contains but little; moreover, the third specimen, which is the thickest, should contain considerably more than the first. But by analysing the specimens, I obtain a totally different result; I find that the specimen which is clear contains most uric acid, and the thickest specimen does not contain so much uric acid as the cloudy specimen. The explanation is this: the first specimen is strongly acid, whilst the clear specimen is neutral, or very slightly acid, and the third specimen is much more acid than the first. This shows that a state of increased acidity may lead to the deposit of urate of ammonia; and that a state of decreased acidity will mislead the eye that judges from appearances.

Let me illustrate the variations of the uric acid more fully, by referring to the table at the commencement of this lecture; you will see that the urine passed at two o'clock p. m., after the digestion of mixed food, contains on an average 0·52 gr. of uric acid; and its acidity is such, that it requires thirteen measures of test alkali to neutralize it. At seven o'clock p. m., before dinner, the amount of uric acid is 0·12 gr.; and the acidity requires, to neutralize it, 26·12 measures,—the specific gravity of the urine, however, remaining nearly the same. After vege-

ble food, at two o'clock p. m., the quantity of uric acid is 0·56, and the acidity is represented by 8·89 measures. Long after food the quantity of uric acid is only 0·05, the acidity requiring 26·36 measures of test alkali to neutralize it. At night, after food, the uric acid is increased, but the acidity much diminished. The same table (No. 1) shows also the variations effected with animal food. The following table shows the highest and lowest amount of uric acid that I have met with in health, after animal and after vegetable food.

*Highest and Lowest Amounts of Uric Acid.*

| | | | |
|---|---|---|---|
| Highest after animal food | ... 1·02 grs. | per 1000 urine | ... 1027·8 |
| „ vegetable food | ... 1·01 | „ | ... 1025·6 |
| Lowest after animal food | ... 0·05 | „ | ... 1024·8 |
| „ vegetable food | ... 0·05 | „ | ... 1024·0 |

From this table, you see that it makes no material difference in the quantity of uric acid in the urine, whether animal or vegetable food is taken. Here is a most conclusive diagram, which shows the amount of uric acid, together with the degree of acidity, and the appearance of the urine passed at the same time on three different days.

*Variations of the Appearance, the Acidity, and the Amount of Uric Acid.*

| P.M. | | Grs. | Sp. Gr. | | Acidity. | Uric Acid. | Appearance. |
|---|---|---|---|---|---|---|---|
| 7 | Urine | 1000 | 1029 | + | 15·5 measures | 0·29 grs. | thick. |
| 10 | „ | ... | 1027 | — | 0 „ | 0·33 grs. | clear. |
| 8 | „ | ... | 1030 | + | 21·5 „ | 0·81 grs. | thick. |
| 11 | „ | ... | 1030 | — | 0 „ | 0·96 grs. | clear. |
| 5 | „ | ... | 1028 | + | 14·9 „ | 0·52 grs. | thick. |
| 11 | „ | ... | 1031 | + | 2·9 „ | 0·87 grs. | clear. |

These experiments must clearly prove that the deposit does not depend upon animal food or upon vegetable food; that these do not produce a distinct effect upon the quantity of urate of ammonia or uric acid in the urine; but that the thickness in the urine depends upon the degree of the acidity. If the degree of acidity is slight, a large quantity of urate of ammonia may remain in solution; if the acidity is considerable, then even a small quantity of urates may give a precipitate.

The way to determine the amount of uric acid is the following—About one or two thousand grains of urine are taken; hydrochloric acid is added in the proportion of about two drachms to one thousand grains of urine. The urate of ammonia is decomposed; and, on standing for at least twenty-four hours, the greater part of the uric acid crystallizes out. The crystals are thrown on a fine filter, washed with distilled water, dried, and weighed, and thus the quantity of uric acid can be determined. Let me show you the first effect of the acid. I have here a glass jar, containing a liquid which we may suppose to represent urine, but it is really the excrement of the serpent dissolved in caustic potash. You see there is in the solution a slight deposit of urate of potash, but you get no idea as to the quantity of uric acid dissolved by merely inspecting it. As long as it remains alkaline there will be little if any separation of urate of potash from the liquid; but if I add to it hydrochloric acid, see then what will happen. Look at the curdy mass which will be precipitated, so solid that this heavy glass rod will easily stand in it. (Experiment.) Thus you can form no conjecture as to the quantity of uric acid in solution in any fluid by simply looking at it. All the uric acid present must be first precipitated. I added a considerable quantity of hydrochloric acid to the jar. If I had added but a small quantity, I should have precipitated only a portion of the uric acid which was in solution, but by adding an excess of hydrochloric acid, all the uric acid has fallen as a precipitate. It is interesting to notice the form in which this is first precipitated. You have seen that at first it is quite gelatinous, and the glass rod will easily stand in it; but in the course of a short time a change will be effected, and the mass will become much more liquid, so that the rod falls as you see it falling, and in a short time the contents of the jar become so fluid that they can be poured out. The first precipitate is undecomposed urate of potash; it has been called hydrated uric acid, but I do not believe

that it is so. The first precipitate is urate of potash, because the uric acid is not set free immediately; it requires that the hydrochloric acid should be some time in contact with the urate of potash to decompose it. So also, if you slowly add hydrochloric acid to urine, you will frequently find a thick deposit formed rapidly; this deposit will redissolve by heat; it will not become changed into an insoluble substance; it will require, for this purpose, to stand for twelve, twenty-four, or perhaps forty-eight hours, and then the precipitate will be far less bulky than before. If the quantity of uric acid be small, and the quantity of acid added be small also, it will require a long time before the whole urate of ammonia will be decomposed, and the uric acid will be deposited in a crystalline form. I have no doubt that this is a most happy preservative from the more frequent formation of uric acid calculi. We have free acid passing off with urate of ammonia in the urine, and they may remain in contact therein for a time, provided the quantity of free acid be not great, without the uric acid being set free, so as to form red gravel. Most commonly urine containing free acid must stand some hours after it has passed from the bladder before red crystals become apparent; nevertheless, sometimes the urine contains so much free acid that the uric acid crystals are found in the bladder, and even the kidney. I have dwelt on the fact of urate of ammonia not being immediately decomposed by free acid, because I do not doubt that thereby we are daily saved from the formation of that gravel which constitutes that kind of calculus which is found most frequently to occur.

I have thus tried to bring before you the causes which lead to the deposit of urate of ammonia, and to the formation of uric acid calculi. I might say, that the acidity produced by the stomach is the cause; and that, in comparison, all other causes may be neglected. The quantity of acid set free in the stomach is not easily calculated; it certainly produces a greater effect on the urine than three drachms of diluted sulphuric acid do,—most probably the gastric juice produces a greater effect on the urine than six drachms, or perhaps more than one ounce of diluted oil of vitriol. As to the quantity of acid in the gastric juice no right conjecture can be formed as to its amount. We cannot collect the whole of the gastric juice, and even if we could it would be impossible to say how much of the acidity comes from changes in the starch and sugar of the food. However, the variations of the acidity of the urine, when animal food only is taken, show how much the acidity of the stomach affects the acidity of the urine. The liberation of acid in the stomach is one great cause of the acid re-action of the urine, and occasional increased acidity of the stomach first gives rise to occasional deposits of urate of ammonia in the urine. When the acidity of the stomach becomes more frequent these deposits become more frequent in the urine; and when the acidity of the stomach becomes increased in intensity as well as in frequency, then the deposit of urate of ammonia gives place to a formation of uric acid crystals, which ultimately form these immense masses of calculous matter which you see on the table before you.—*Med. Times, Oct.* 25, 1851, *p.* 425.

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## 60.—ON THE ACID REACTION OF THE URINE.

By Professor C. G. Lehmann.

The following paragraph contains a summary of all that is known regarding the acid reaction of the urine:—

The cause of the *acid reaction* of normal urine long remained obscure. This acid reaction was formerly attributed to the presence of lactic acid, and even of acetic acid; Liebig has, however, investigated the subject, and shown that it can only be dependent on acid phosphate of soda. If we dissolve ordinary phosphate of soda in water (thus forming a solution with an alkaline reaction), and gradually add uric acid (which has no reaction on vegetable colours), and apply heat, we obtain a fluid which reddens litmus, and which, on cooling, deposits a white, crystalline powder, presenting under the microscope the most beautiful groups of prismatic crystals of urate of soda. Now, if so weak an acid as uric acid can abstract a portion of its base from phosphate of soda, there can be no doubt that [illegible] lithuric acids, directly on their formation of [illegible] the neutral phosphate of soda into

an acid salt, in which form it passes with the sulphate, lactate, and hippurate of soda into the urine. If the acidity of normal urine generally can be explained in this manner, the fluid should never saturate more base than corresponds to its quantity of phosphate of soda. The experiments which have been made to elucidate this point, are, however, not so easy to conduct as might at first sight appear, for after treating urine with an alkali till there is neither an acid nor an alkaline reaction, it will still contain acid phosphate of soda in solution; for the neutral phosphate of soda has an alkaline reaction, and, therefore, the acid salt (if the urine exhibits no reaction on vegetable colours) is still not neutralized. I have endeavoured to ascertain the quantity of free acid in the urine in the following manner:—The urine was precipitated with an excess of chloride of barium, the precipitate boiled with water containing sulphuric acid, and the weight of the sulphate of baryta determined; an equal quantity of urine was then digested with freshly precipitated carbonate of baryta, till all acid reaction had disappeared; the filtered fluid was then acidulated with a little acetic acid, and precipitated by chloride of barium; this precipitate also was washed with water containing sulphuric acid, and weighed; the quantity of the latter was far less than that of the first-weighed sulphate of baryta, the difference of the weights corresponding to a quantity of sulphate of baryta, whose base had been exactly sufficient to saturate the free acid contained in the urine; hence we can readily calculate from the chemical equivalents the quantity of the free acid or of the acid phosphate of soda. Now, if the calculation thus made did not give more acid phosphate of soda than was shown by a differently-made analysis to be actually contained in the urine, the acid reaction of the urine would be *alone* dependent on the acid phosphate of soda. This was certainly often the case; but both in healthy and in morbid urine I frequently met with the opposite condition, that is to say, in comparing the baryta-salts, the quantity of acid phosphate of soda which was calculated was more than that found by direct analysis; hence, in the majority of cases, in addition to the acid phosphate of soda, the urine must contain a free organic acid, or another acid salt capable of reddening litmus. We must not, however, arrive at our conclusions too rapidly, for the acidity of the urine after its discharge often increases so rapidly from the formation of lactic or acetic acid, that the excess of the free acids found in the above experiments might depend on lactic acid developed in the urine after its excretion. In morbid urine, however, we often find so great an excess of free acid over the phosphate of soda, that to these cases the above objection cannot be applicable. The acid reaction of the urine depends, therefore, in many cases, not only on the presence of acid phosphate of soda, but also on the presence of hippuric and lactic acids. If there were only acid phosphate of soda present, the phosphates of lime and magnesia in the urine could only be held in solution either as acid phosphates or by another free acid. If in the above calculation of the free acid from the precipitated baryta-salts, the earthy phosphates are included in the weighing, the result always remains the same, that is to say, there is more free acid than could be derived from all the acid phosphates of the urine. The water-extract of the urine usually has an acid reaction after repeated washings with alcohol, and solely on account of its containing acid earthy phosphates; these must, however, also be present when lactic or hippuric acid is the acidifying principle of the urine.—*Brit. and For. Medico-Chirurg. Review, October*, 1851, *p.* 330.

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## 61.—ON HÆMATURIA.

By Dr. G. Owen Rees, F.R.S., &c.

[Blood may exist in the urine in different degrees; either in such quantities as that the red globules colour the urine by their quantity, or they may be so minute in quantity as to require the microscope for their detection, or the paler parts of the blood may be present, requiring chemical means for their detection. If it be effused in any quantity, the conditions of the various parts of the urinary apparatus must be considered. The treatment of the diseased conditions of these parts is so much within the province of the surgeon that Dr. Rees counsels physicians to *remember* this whenever hæmaturia cannot be satisfactorily explained on other

grounds. There are one or two points to be noticed connected with the examination of urine containing blood. And first, with respect to the recognition of the blood corpuscles under the microscope.]

These bodies, as they float in urine, are seldom seen precisely as they appear in serum. They are thicker at their edges, and the colouring matter within them is paler. This condition is caused by the entrance of urine into the corpuscle—an effect which occurs in virtue of the law of endosmosis. The blood-corpuscle naturally contains within its membrane a fluid of the same specific gravity as the liquor sanguinis; and when, therefore, it comes in contact with the urine, which is far below the specific gravity of the liquor sanguinis, endosmodic currents are immediately set up, an interchange takes place between the contents of the corpuscle and the urine without, and, as the urine is of less specific gravity than the contents of the corpuscle, the interchange takes place in such manner that it enters the corpuscle in greater proportion than the contents pass out; and thus the body becomes distended.

I shall hereafter have occasion to allude to the presence of pus and mucus in the urine, together with blood, and to the importance of detecting them, inasmuch as we are thereby greatly assisted in our diagnosis in certain obscure cases of hemorrhage; and I will therefore now describe the appearances presented by pus and mucus when so observed. Pus and mucous corpuscles are both larger than those of the blood: they are colourless, and variegated on their surface: whereas the blood corpuscle is smooth and of a light yellow colour. The pus corpuscle very closely resembles the mucous; but, if carefully examined, we observe that it is dotted and granular rather than variegated on the surface, and of looser texture than the mucous corpuscle. The reactions of urine containing blood are easily appreciated; and there is but one source of fallacy to which it is necessary to direct your attention. This consists in a condition of urine which will seldom be present to confuse you, and I have not seen it more than twice. I allude to the brilliant red colour sometimes produced in urine by certain articles of diet. Many vegetable matters colour the urine of a fine amber colour; the pyrola and sumach possess this property in a marked degree. Sometimes this colour will nearly approach to red; and occasionally, when beet-root has been eaten, the colour observed in the urine is so completely that of blood, that it is impossible to discriminate without having recourse to the use of reagents. The distinction is easily made, however. If the urine be tested by the liquor potassæ, a dirty brownish precipitate is produced if the colour be owing to blood; but, in the case of vegetable colouring matter, the urine will become of a fine green tint.

When blood is present as a deposit in urine, in any quantity, we may be sure that albumen exists in solution; and it is important that we should know, within certain limits, the corresponding degree to which we may expect the urine to be albuminous for any given quantity of red corpuscles which may appear in it. An approach to tolerable exactness may be attained by practice and attention to this point; and it is one of great value in the diagnosis of urinary diseases. When we boil urine containing albumen, if it be acid, as is generally the case, a precipitate is produced. Now when blood is present, you will be surprised how much of it is required to produce an amount of albuminous precipitate such as characterises cases of ordinary albuminuria. Unless, indeed, the urine present the appearance of being made up in very large proportions of blood, the amount of albumen will generally be trivial. This will not appear extraordinary to those who are in the habit of observing how much show a little blood can make; and the quantity of albumen in the urine of morbus Brightii may well appear comparatively great, when it often amounts to as much as indicates the disintegration of several ounces of blood per diem; and one ounce of blood will make a great show in the quantity of urine passed in twenty-four hours. The importance of paying attention, then, to this point, principally consists in our being able occasionally to detect the morbus Brightii by showing an amount of albumen in the urine far above that indicated by the red corpuscles present.

Returning to the pathology of the subject, let us now assume that careful examination of the bladder and prostate gland has satisfactorily shown that the kidneys or ureters are the source whence the blood contained in the urine must be derived, and consider to what condition of those parts the hemorrhage should

be attributed. First as regards idiopathic hæmaturia. This bleeding from the surfaces of the kidney, without any special cause beyond exposure to cold or to the vicissitudes of climate in warm and damp localities, has been considered as rare by most writers. For my own part, it has so frequently occurred to me to detect the cause of such hemorrhage in lesion of some organ, that I am much inclined to deny hæmaturia ever occurs, except as an indication of decided disease of the kidney or other part of the urinary apparatus. It is true, idiopathic hæmaturia sometimes occurs, together with hemorrhage from other mucous surfaces, in those who ascend to great heights, and who consequently suffer the loss of that amount of atmospheric pressure which preserves the conditions of equilibrium necessary to the safe circulation of the blood; but we may at once exclude such cases as these from the consideration.

With respect to the appearance of the urine, Dr. Prout considered that, when blood tinctured the whole fluid, appearing equally dissolved throughout it, that the kidneys were generally involved. This is an observation which experience certainly verifies. When such an appearance is observed, however, it co-exists or alternates generally with blood as a deposit, and we may conclude that there is calculus in the kidney, or that the organ is the subject of other diseased condition, attended either with great congestion, granular deposit, or malignant disease. The detection of the real state of matters becomes very important in such cases. The symptom is a prominent one, and the patient's friends are sure to press the practitioner urgently for his prognosis. Now, though in most cases, if calculus be present, the history or severity of symptoms will assist us at once to the truth, yet it sometimes happens that such evidence is not afforded; and this is more especially the case when oxalate of lime calculi are contained in the kidneys. Under these conditions the urine may be bloody, and no other symptoms observed beyond dull lumbar pains. If oxalate of lime crystals exist in the urine, there is also pain in the penis, which does not affect the glans penis, as in stone in the bladder; but, on the contrary, is most plainly felt at the root of the organ.

Now, though in these cases the hemorrhage will generally follow upon some unwonted exertion, still it is not always so, and the case is thus greatly obscured; for we lose a most important adjuvant to our diagnosis. If the hemorrhage is the result of any of those chronic states of disease to which the name "morbus Brightii" has been given, we may easily detect that it is so, for then the hemorrhage which may occur will soon be found to give place to other conditions, in which the colourless matters of the blood alone become effused. We have here only to wait; and, whenever the urine may be excreted of its natural colour, to test it for the presence of albumen; and if this principle then be present in any quantity, without the colouring matter of the blood, we may be nearly certain that the further progress of the case will be marked by the continued excretion of natural coloured urine containing albumen, and not by hemorrhage, and that the patient is suffering from some form of the morbus Brightii.

If, however, the urine, on becoming of its natural colour after an attack of hæmaturia, does not prove to contain albumen, then we may feel nearly sure that the hemorrhage proceeded either from a calculus in the kidney, or some malignant disease of the organ.

The diagnosis between these two conditions must depend on the observation of the following points.—

1st. In malignant disease the blood is generally passed in larger quantity than in calculus of the kidney.

2ndly. There is more frequent tendency to nausea *on slight occasion* than in calculous disease.

3rdly. Microscopic examination of the urine will frequently show pus or mucus in excess, if there be calculus; whereas, in malignant disease, this sign does not so frequently exist.

4thly. The appearance of those suffering from malignant disease of the kidney, is nearly always indicative of a state of anæmia more or less advanced.

5thly. In calculus, hæmaturia generally follows upon some unwonted exertion.

6thly. Careful examination of the abdomen will frequently lead to the detection of tumour if there be malignant disease of the kidney.

To sum up, I should say, in the first place exclude from the consideration, cases

of what has been called idiopathic hæmaturia, which can scarcely exist under ordinary barometrical conditions; secondly, determine that the case does not belong to the morbus Brightii, by ascertaining that when the red particles cease to appear the albumen also leaves the urine; and, thirdly, when the hemorrhage observed is placed within these limits, determine whether it be owing to calculus in the kidney, or to malignant disease, by especial attention to the following points:—The appearance and complexion of the patient; the presence or absence of nausea on slight occasion; the presence or absence of pus and mucus in the urine mixed with blood corpuscles; and lastly, by careful exploration of the abdomen for the detection of tumour.

Now as regards the treatment of the two forms of hæmaturia I have been speaking of,—viz., that produced by calculus in the kidney, and that which is the consequence of malignant disease.

From what I have already brought before you with respect to the treatment of alkaline urine, as produced by irritation of the urinary mucous surface, you will at once perceive that the condition brought about by the existence of a calculus can never be benefited by the exhibition of other than demulcent and alkaline remedies. It matters not how the calculus may be composed,—be it uric acid, oxalate of lime, or phosphatic,—be it soluble in acids or alkalies,—we cannot treat it chemically while in the kidney. Our object must be to render the urine as unirritating to the mucous membrane as possible, and enable that membrane thus to bear the presence of the calculus with as little inconvenience as possible. There is another indication, however, which we answer by this alkaline and demulcent plan, and a most important one. It consists in the relaxation of the spasm of the canal. By effecting this, a small calculus may be often brought away, which otherwise might remain to increase, and perhaps destroy the patient. It is with this view that we should combine our demulcent and alkaline remedies with such sedatives as the patient can bear without disturbance of stomach. Our most favourable result, of course, will be the expulsion of the calculus. Next to this we must hope that it will become encysted, and, by being so fixed in the kidney, cease to cause irritation; while we have to fear, as the worst result, the setting up of inflammatory action in the body of the kidney. This may terminate in the effusion of lymph in the tissue of the organ, and in a subsequent contraction of the inflamed part; and sometimes the patient may be so fortunate under these circumstances as to have the calculus which has caused the acute nephritis, should it be a small one, impacted in the kidney, so as to create no further irritation. In a great many of these cases, however, the acute nephritis terminates in suppurative disease; and if there be any constitutional imperfection dependent on strumous or syphilitic taint, this is the way in which we may generally expect the case to end. All we can do under these circumstances is to support our patient, exhibit opiates, and render the renal secretion as unirritating as possible. It is absolutely necessary that such persons should avoid exercise in any way beyond that necessary to walking gently, or exercise in any easy carriage. Neglect of this doubles the danger to the patient, while the difficulty of enforcing the injunction is often very great.

With respect to the treatment of cases in which the hæmaturia depends on malignant disease of the kidney, of course we cannot proceed with any hope of cure; but much may be done by attention to the general health, and by relieving those symptoms which arise as the result of the hemorrhage and the impaired state of the chylopoietic viscera. The anæmia so often noticed in these cases, which causes dyspnœa on slight exertion, and restless nights (from the facility with which any error in diet produces palpitation and throbbing of the carotids), may be to a great extent combated by the exhibition of iron in some palatable form. Perhaps the best preparation for the purpose is the tinctura ferri sesquichloridi, taken in doses of from ℥x. to ℥xx. three times a day, the bowels being watched the while, and kept regular by the exhibition of mild and aromatic laxative medicines.

It may be objected to the use of iron that it frequently tends to produce hemorrhage, and that we ought scarcely, therefore, to exhibit it; and it is quite true that care is necessary on this point. Watch the effects of the remedy, however, and you will constantly find you can exhibit it with advantage; that it will not induce hæmaturia, and especially if it be exhibited in the form of the sesquichloride of iron tincture. With regard to the use of styptics, they frequently

appear useful in cases where the disease is not much advanced. One of the best I know, and which I have used several times of late, is the tannic acid, exhibited, if necessary, at intervals between the doses of iron in the form of pill. The dose should be from four to eight grains three times in the day. I may here remark, with respect to the use of this remedy, that, if you wish it should reach the stomach as tannic acid, you must not exhibit it in solution. You may, if you do so, have the good luck to give the first dose before it becomes changed; but tannic acid is rapidly converted into gallic acid when dissolved, and the best means of exhibiting it unchanged is in the form of pill.—*Med. Gazette, July* 11, 1851, *p.* 48.

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## 62.—ON ALBUMEN IN THE URINE AS A SYMPTOM OF DISEASE.

By Dr. G. Owen Rees, F.R.S., &c.

[Upon this symptom, to which the attention of the medical profession has been directed for many years, and which forms the leading feature of the disease called morbus Brightii, Dr. Rees remarks:]

I shall not now describe the methods of detecting the presence of albumen, but, assuming the fact established, I shall beg your attention to the pathological considerations of which it is suggestive in the present state of our knowledge.

When Dr. Bright published his views on this subject, and declared his belief that an albuminous condition of the urine indicated a peculiar state of kidney, which commenced in congestion and terminated in the deposit of an adventitious matter in the tissue of the organ, some doubt was felt among pathologists as to the symptom indicating the condition described with any great degree of accuracy. It was thought improbable that the state of kidney noticed by Dr. Bright could be the only cause capable of producing albuminous urine; and some were even so bold as to assert that many articles of food would produce a similar effect on the excretion. The exhibition of certain remedies also, and various pathological conditions, were quoted, which theory suggested as capable of bringing about the result; and, what with intrepid assertion on the one hand, and plausible reasoning on the other, considerable doubt was for some time cast on the diagnostic value of albumen in the urine. Among the articles of diet said to produce albuminuria I may mention pastry, milk, and cheese. Among medicines, some diuretics were thought capable of producing a similar effect; and mercury, if exhibited in salivation, was confidently spoken of as a cause for albuminous urine. The pathological states which have been at different times quoted as causes are very various and very numerous:—typhoid and typhus fever; certain forms of rheumatism; severe inflammatory affections, &c.

First, then, with respect to articles of diet:—Neither milk, cheese, nor pastry, will produce albuminous urine; nor have I yet been successful in obtaining from those who have made these loose statements a specimen of urine which gave the remotest indication of the presence of albumen, provided it had been previously shown free from that principle. I have also failed to detect albumen in the urine where diuretics have been given medicinally, though it is possible that in poisonous doses some of these may produce the effect. In poisoning by cantharides, albumen appears with blood in the urine: but such cases as these are scarcely likely to confuse your diagnosis. With respect to mercury, the impression was so strong on the minds of some that it always produced albuminous urine when exhibited in large quantity, that a few years ago I was at the pains of carefully examining the urine of persons who were undergoing salivation for syphilitic disease at Guy's Hospital, taking care to test the urine of each case before the exhibition of the remedy. In these experiments I entirely failed to detect albumen, and I have no doubt that the conclusion above alluded to was arrived at on theoretical grounds.

[The important conclusion Dr. Rees comes to, with regard to the presence of albumen in the urine, is, that it must be regarded as most significant; that continued albuminuria, unconnected with lesion of the kidney, is rare; but we cannot, in such case, arrive at the conclusion at once that the patient is suffering from Bright's disease, because puerperal fever, asiatic cholera, pyelitis, and inflammation

of the urinary mucous surfaces generally, will produce albumen in the urine; it will even appear in a variety of diseases before death, and also now and then during gestation. But, in cholera, puerperal fever, and gestation, there is little likelihood of any of these conditions being mistaken for morbus Brightii. In pyelitis, and inflammation of the urinary mucous surfaces, the cause is not so clear where a discharge of pus takes place. The fluid in which the pus globules float contains albumen, and this mixing with the urine renders it albuminous.]

Thus, in inflammation of the mucous membrane lining the pelvis of the kidney and the urinary tubes, or in inflammation of the lower portions of the urinary mucous membrane, albuminous urine may exist. Though the general symptoms will by no means always assist us to discriminate between these states and the morbus Brightii, the microscope and chemistry will generally easily solve the difficulty. The nature of the deposit must be examined, and we shall find the pus corpuscles present in quantity if the albumen in the urine depend on the above-mentioned causes, and not on kidney disease. The microscope will then detect the pus corpuscles in the deposit. An excellent test for pus consists in the addition of liquor potassæ to the urine, when the deposit, if it be pus, is at once converted into a mucous fluid. This, when poured out from a vessel, exhibits its glairy character. This test was proposed by my friend and colleague Dr. Babington, and is often very useful in the extemporaneous examination of urine. Urine which is albuminous from the existence of Bright's disease, is also nearly always of a light specific gravity; and this is an important point to remember.

In any case in which the albuminous urine contains a deposit of pus, however, we must rather look to the mucous tissues of the kidney, and the membrane lining the bladder and urinary canals.

It not unfrequently happens that the cystitis consequent on calculus in the bladder produces purulent and albuminous urine, and there is then some difficulty in ascertaining whether that form of degeneration characteristic of Bright's disease may not be affecting the kidney at the same time. This is a point of some importance as regards the prognosis of the case, for if the kidney be so diseased the patient scarcely ever recovers from the operation of lithotomy.

It is necessary to obtain the urine free from pus before we can speak with anything like certainty in these cases. If we can succeed in doing this by means of demulcents and astringents, in conjunction with alkaline remedies, then we may proceed to examine the urine with some hope of arriving at a conclusion. If, for instance, the albumen leaves the urine in proportion as it becomes free of the deposit of pus corpuscles, and if, on the disappearance of the pus, the albumen cease to be present, then the albuminous urine was unconnected with the morbus Brightii. If, on the contrary, however, the disappearance of the deposit of pus leaves the urine still impregnated with albumen, then the morbus Brightii is probably present, and we ought to give an unfavorable prognosis.

Attention to this point is of vast importance, and I have known more than one case in which much disappointment and chagrin might have been spared the surgeon, had care been taken to inquire into this matter.

When albumen, then, exists in the urine, *without pus or blood* to account for its appearance, we may conclude that the patient is the subject of one of those forms of degeneration known as the morbus Brightii, provided we have excluded puerperal fever, gestation, and cholera, as possible causes. It must be remembered that bloody urine will occasionally be passed in Bright's disease; but the prominent and continuing characteristic is the secretion of an urine containing the serous part of the blood *only*, and when red blood corpuscles are to be seen they appear but for a day or so, and then the urine returns to its purely albuminous state. In the slight notice I am here able to give of the morbus Brightii, I must omit the general detail of symptoms. I cannot refrain, however, from mentioning to you one or two points with respect to diagnosis, which you will find of value. You may derive great assistance from the observation of the following symptoms, which, when present, should always lead to the examination of the urine for albumen:—

1st. A puffiness of the face observed in the morning.

2ndly. Frequent calls to pass water at night.

3dly. A tendency to swelling of the wrists, often attended with pain, but not of a rheumatic character.

4thly. Dyspepsia, attended with frequent nausea.

Do not expect always to find pain in the loins in Bright's disease. It is *sometimes* a symptom, but far from *always*, and I warn you of this, because the absence of that pain may distract your mind from the right line of thought, when examining the more insidious cases of the disease.

With respect to your prognosis, it is important you should remember that this disease is by no means necessarily fatal. Cases which are detected early are frequently cured, and those who suffer from the more advanced stages may be kept alive for years under judicious treatment.

One great point to keep in view, especially as regards the application of remedies, is, that the albumen passing away by the urine is impoverishing the blood, and not only thus decreasing the proportion of albumen, but likewise interfering with the formation and development of the red corpuscles, so that patients become rapidly anæmiated.

The relation between the contents of the red corpuscles and the chyle becomes changed in consequence of the drain of albumen lessening the specific gravity of the liquor sanguinis, in which the corpuscles float. Now the chyle supplies iron to the red corpuscles, and contains that metal dissolved in its serum for that purpose, and when in the healthy state the chyle enters the blood through the thoracic duct, it produces certain physical changes. The specific gravity of human chyle is about 1027; that of the fluid in which the corpuscles float is 1050 to 56; and the fluid contained in the corpuscles must of necessity be of the same specific gravity, in virtue of the endosmodic law. When the chyle mingles with the liquor sanguinis then it lessens its specific gravity, and *in health* there is an endosmodic action exerted, which draws a considerable proportion of the chyle within the blood corpuscle, the law being that the heavier will draw the lighter to its own side of any membrane, in larger proportion than the lighter can draw the heavier.

It will be obvious now, that if we lessen the specific gravity of the fluid in which the corpuscles float, *by abstracting its albumen*, we shall also lessen that of the contents of the corpuscle. The contents of that body will then approach to the specific gravity of the chyle, and that fluid will therefore enter the corpuscle the less freely, and there will be less iron supplied to it for its nourishment. Thus it is that anæmia, or a deficiency of red corpuscles, will always follow as a consequence of a drain of solid matter from the blood.

Now the point of treatment on which all this bears, is the propriety of doing all we can to render the blood as nearly as possible of its proper specific gravity. Owing to this drain of albumen there is an excess of water in the blood, and, as I have said before, the corpuscles subsequently become deficient. How are we to remedy this evil, and what remedies should we call to our aid? It is satisfactory to know that theory here suggests what experience has long ago discovered, viz., the use of hydragogue cathartics, vapour baths, and iron. I by no means recommend the indiscriminate use of iron. It is not admissible in the early stages of the disease when active symptoms are present. It must rather be looked upon as cinchona and quina are wont to be regarded in the treatment of rheumatism, and it must follow the antiphlogistic treatment recommended in class works on this subject. To its great value, however, in the anæmia caused by the morbus Brightii, all who use it will, I am persuaded, most readily testify. As regards the use of iron generally in anæmia, I must here beg your indulgence while I urge upon you to persevere in its use in spite of those occasional complaints on the part of the patient, which in most cases arise from the inconvenience experienced from changes of temperature, or moisture, or errors in diet. It is not uncommon to hear it stated that iron does not agree in all cases of anæmia. It so happens that one of my duties at Guy's Hospital consists in seeing the female out-patients, and I doubt very much that any practitioner on the face of the globe orders as much iron as a medicine as I do; and I speak advisedly when I say that I scarcely ever knew a case in which I had to withdraw its exhibition, and that I never knew a case of chlorotic anæmia in which it did not prove of eminent and marked service.

I have had complaints during the progress of the case of headaches and restlessness, but have always found a purge and perseverance in the iron effect a cure. If

you desist from its use for every change of weather which may for a time further relax the system and ruffle the temper (especially that of the more susceptible sex), your difficulties will never cease, and your only consolation will be, that most imperfect one, the multiplication of your fees; for you will retard the progress of the patient's cure very materially. Persevere—abstract the excess of water from the blood by saline purges, and afford the stomach every opportunity of introducing iron into the system.—*Med. Gazette, July* 11 *and* 25, 1851, *pp.* 48 *and* 133.

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## 63.—ON THE PRESENCE OF THE EXTRACTIVES OF THE BLOOD IN THE URINE WITHOUT ALBUMEN.

By Dr. G. Owen Rees, F.R.S., &c.

[Dr. Rees now brings before our notice another kind of effusion from the renal secreting surface, neither blood nor serum, but of *some of the components of the serum*. Dr. Rees urges the importance of this, though in consequence of the difficulty felt in recognising it, it has not yet been investigated by the profession. Dr. Rees proceeds:]

Keeping in view that the renal surface has been proved subject to an effusion of serum under special conditions, let us now look into the general question of effusion, and the constitution of the various fluids poured out in different parts of the body, and remember how the constituents of the blood are found to divide themselves to form fluid deposits in disease. Taking the chemical history of serous effusions generally, we shall find that in pleuritis and peritonitis of an acute character a fluid is poured out characterised by the presence not of the entire blood, nor yet of the serum, but that the liquor sanguinis is poured out, and that this separates after its effusion into serum and fibrin; the former forming the effused fluid, and the latter depositing in those various forms known as plastic matter, false membrane, &c. Again, serous effusions, especially when of a passive character, are characterised by the absence of fibrin. In fact, serum and not the liquor sanguinis is effused, and this form of effusion varies greatly in its specific gravity. It may contain a larger or a less quantity of albumen. Now, if we look to the more delicately constructed serous membranes, we find conditions which but rarely pertain under inflammations of the pleuræ or the peritoneum. And it is with these more delicate membranes, such as the arachnoid, both in the brain and as it surrounds the spinal cord, that we may more justly make comparison with the secreting surface of the kidney. The effusions into these membranes, though they occasionally contain both fibrin and albumen,—that is to say, though they may deposit plastic matter, and be coagulable by heat, are more commonly constituted of those parts of the blood denominated extractive matters, and which exist in combination with the various alkaline salts of the blood. This is especially the case when the inflammation producing the effusion is of a chronic or subacute character; when the blood merely pours out its water, extractives, and salts. In some cases of arachnitis I have known the fluid effused to consist almost entirely of water, the evaporation of half a pint of it yielding scarcely any residuum. Thus, so far as the chemical history of effusions can assist us, we perceive that the blood may cast off—1st, water alone; 2dly, water, extractives, and salts; 3dly, water, extractives, salts, and albumen; 4thly, water, extractives, salts, albumen, and fibrin.*

In applying what I have now described to you as the results of analysis to the consideration of urinary pathology, you will at once perceive that as we have the serum of the blood effused by the kidney in certain diseased conditions, analogy suggests the probability that there may be some pathological states in which the extractives and salts only may be effused in the urine with the water of the blood, the albumen not appearing.

The subject having presented itself to my mind as I have now described it to you, I determined, a few months ago, on making some observations on the patients at Guy's Hospital, with a view, if possible, of determining whether such

* I would here refer those who may be interested in the question of effusions generally, to a most valuable paper on the subject, written some years ago by my friend, Dr. Babington, and published in the Medico-Chirurgical Transactions.

a drain of the extractive matters of the blood really ever took place,—whether, in fact, the blood were thus sometimes losing its solid constituents in a form we had not yet learned to recognise for want of proper chemical tests of its presence. We possessed ample means of detecting the serum of blood when present in the urine from the reaction afforded by the albumen; but the question now was—How could we detect the extractive matters and salts, which are not only colourless, but very nearly resemble in their chemical reactions the extractive matters naturally existing in the urine? Considering this question, it occurred to me that one of the extractive matters of the blood was precipitable by the tincture of galls; whereas the extractives of the urine possessed this quality in but a slight degree. It became, therefore, a matter of interest to determine in how far this test was capable of making pathological distinctions, and whether the presence of the extractives of the blood in the urine without albumen were significant of any particular disease or of any class of diseases. It struck me that if the analogy between the effusion of serum by inflamed serous membranes and by the secreting surface of the kidney held good, we ought always to find the extractives of the blood effused into the urine with the albumen in albuminuria, as this always happens when albumen is present in ordinary serous effusions. To determine this, my first experiments consisted in testing albuminous urine with the tincture of galls. I began by separating the albumen by brisk boiling and filtration; and having ascertained that the filtered fluid no longer contained any of that principle, I then tested it by the tincture of galls to see if the extractives of blood were present, and had coexisted with the albumen. The test gave, in all these cases of albuminuria, a most abundant precipitate, showing the analogy between the effusion which occurs in the morbus Brightii and that observed in serous membranes. My object being so far attained, I now proceeded to construct a table which should show the reaction of the urine in such cases as I could obtain among the patients in Guy's Hospital. I had a column devoted to the test by boiling, and another to the test of nitric acid, so that I might be able to exclude from the consideration all cases distinguished by the presence of albumen. A third column showed the reaction of the tincture of galls. As the labour of collecting and weighing the precipitates would have been great, and, moreover, unnecessary in these comparative experiments, I employed three terms to describe the amount of coagulation produced by the test. The first degree was designated "copious;" the second, "considerable;" and the third, "slight." I was assisted in this work by two of my most intelligent clinical clerks, Messrs. Crawcour and Bown; the cases being principally taken from the clinical wards. The general result shown by the table we used was—

1st. That whenever albumen was present in quantity in the urine, it was always accompanied by the extractives of the blood in large proportion.

2dly. That the cases in which the extractives of the blood were in the urine in large proportion were generally those marked by debility.

3dly. That cases of anasarca, with disease of the heart, and *unconnected with albuminuria*, also showed the extractives of the blood to be excreted by the urine in quantity.

4thly. That cases of chlorotic anæmia and hysteria gave copious precipitates.

5thly. That when in albuminuria the albumen became deficient in the urine, which we know often happens in advanced cases, the blood extractives also decreased in quantity.

6thly. That in cases of anæmia the proportion of blood extractives observed in the urine diminished as cure was proceeding under the use of ferruginous tonics.

The limited number of cases which have as yet been observed, and the extended nature of the enquiry, make it right that we should be careful in drawing conclusions. I think, however, we may safely state that we have already proved beyond a doubt that in certain diseased conditions an important drain upon the blood is going on, of which we have been totally ignorant up to the present time.

That urines vary in their reaction with regard to any test, would be in itself enough to show the importance of analysing the fact; but when we remember that tincture of galls is the precipitant of one of the extractives of the serum of blood, and that albuminous urine containing the serum of the blood gives the most copious result when tested by galls, we must at once admit that the blood is

becoming disintegrated when the urine is precipitable by the tincture, and feel the propriety of watching this source of waste in those forms of disease in which it may hereafter be proved to exist. From what I already know, I think we may confidently hope, at no very distant period, to connect this effusion of the blood-extractives into the urine with a peculiar state of kidney—a condition producible, probably, by more than one pathological action, but one which it is highly necessary to counteract in all. We may consider that a new symptom has been afforded us by chemistry: it remains for us, however, to ascertain its precise value, by determining the correct interpretation to be put upon the indication.

When I was speaking of the anæmia which occurred as a sequel to albuminuria, I explained how it was a necessary result of the impoverished state of the liquor sanguinis in which the corpuscles float. We see now, however, that a drain may go on from the liquor sanguinis by its *extractives passing away by the urine*, without any albumen appearing, and that we may thus have another cause for the appearance of anæmia besides that of a drain of albumen; for the extractive matters tend greatly, by their presence, to keep up the specific gravity of the blood. Reflecting upon this, it occurred to me that, in some of those cases of anæmia in which we entirely fail to detect any adequate cause for the symptom, we might perhaps find that the blood became impoverished by the extractives passing away in the urine; this deterioration of the liquor sanguinis being followed, as in the case of albuminuria, by the destruction of the corpuscles.

This is a point deserving of attention; but at present I can do no more than direct the attention of practitioners to the investigation of such cases with relation to the condition of the urine. My friend and colleague, Dr. Addison, has shown that the renal capsules become implicated in this form of disease—a fact of some interest in connection with what I have above stated. It may be well to mention that, in a case of diabetes insipidus, I lately found the blood extractives coming away in very large proportion.

I would not wish it to be supposed that I attach an undue importance to this symptom of urine being precipitable by tincture of galls. The urine of those whose condition approaches to perfect health will often show traces of the presence of the extractives of the blood; and I have reason to believe, that whenever, from hard labour, mental or physical, a certain amount of anæmia follows, the urine will be found impregnated with these extractives. Perfectly healthy urine, however, shows but a slight precipitate on the addition of the tincture.

It is absolutely necessary to remember, in applying this test, that the reaction to be observed is that which immediately follows the addition of the galls; for, if we wait, we almost always get a considerable precipitate; the earthy and potash salts coming down, owing to the precipitating action of the spirit contained in the tincture, and probably other changes occurring.

What we already know, then, of this indication only goes so far as to show that it is the continuance and excess of the discharge of blood extractives that must make us anxious, and that, like the presence of oxalate of lime crystals in the urine, it may often exist without any material variation from the healthy state. Like oxaluria, however, it is an indication that requires watching; and I believe further research may show it to be still more important than we are entitled to declare it in the present state of our pathological knowledge.—*Med. Gazette, July 25, 1851, p. 135.*

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## 64.—ON THE SEPARATION FROM THE BLOOD OF AN EXCESS OF WATER BY THE KIDNEYS.

By Dr. Owen Rees, F. R. S., &c.

Let us first consider the uses of water in the blood, the ends answered by its presence, the necessity for its frequent removal, and for the supply of fresh water to the system.

The first and most obvious use of water in the blood is to maintain its fluidity, and thus to enable various salts and other matters to be presented to the organs in such form as to enable their particles to receive the impress of chemical and probably electrical actions in a minuter state of division than can be compassed by other means. As regards the action of water in the blood, in its relation to

the kidneys and the skin, we must especially regard the following points:—1st. The density of the blood is, in health, nearly always the same; and a large excretion of water calls for immediate supply of a like quantity to the blood; and this happens whether the excess of water have escaped by perspiration or in the urine. 2ndly. The changes which take place in the blood, more especially those of oxidation, and the formation of the alkaline phosphates and sulphates by the union of oxygen with the phosphorus and sulphur contained in the albuminous matters taken as ingesta, require water in order to wash away the salts formed as the result of this action.

Now there is a constant necessity for a supply of water to keep up the specific gravity of the blood, and to wash away the oxidated products as they are formed whenever, from disordered action, the kidneys allow the water of the blood to pass away into the urine in large quantity. The sensation of thirst occurs in all such forms of disease, and its satisfaction is necessary in order to preserve the integrity of the blood. It is true that the skin in excessive diuresis is dry, and that cutaneous transpiration is either lessened or altogether ceases; but the water which is retained in the blood by this action is by no means sufficient to compensate for the abstraction of water which goes on in nearly all cases of diabetes whether saccharine or insipid. The guide for the necessity of supply is the sensation of thirst, and it should always be gratified; for on whatever conditions the diabetes may depend (and, unfortunately, we are as yet greatly in the dark with respect to the pathology of this most interesting disease), it will be in vain to hope to treat it if we do not keep the blood up to its normal standard by supplying water to it at any moment it may be required. Let us think how the blood must suffer in those cases of diabetes, far from uncommonly met with, in which the urine amounts to eight and twelve pints in the twenty-four hours. Let us reflect on what the person who is the subject of disease must lose in water during the twenty-four hours. We may allow two and a half pints for urine, and two and a half pints for cutaneous transpiration, and we shall see then the diabetic loses more than three pints per diem extra, assuming that his skin is absolutely inactive, which is rarely the case. Now six tumblers of water, or thereabout, taken during the twenty-four hours, is a very large quantity, but I do not scruple to say, is seldom more than necessary to keep the blood in a proper state in diabetes, where eight pints of urine pass per diem.

There is a fear often expressed by practitioners that allowing the patient to drink irritates the kidneys, and so keeps up the flow of the water—in fact, that the more the patient drinks the more urine passes. This is true if fluids be taken beyond certain limits, but it does not act materially when fluid is taken so as to satisfy thirst; and I have always seen greater improvement take place where this boon was granted to the patient; and everything we know of the blood, and the necessity of maintaining it at a certain fixed specific gravity, points to the propriety of allowing it.

Having alluded to diabetes in this manner, it might be supposed that I regard that disease as an effusion of water by the secreting surface of the kidney. Should such a condition obtain, however, it can only be a diseased state induced secondarily upon other evils more nearly connected with disturbance of the chylopoietic organs, and probably the brain. It is not my intention, however, to enter upon this subject, but merely to suggest that analogy would seem to point to the probability of an occasional increased flow of water from the kidney, as the result of some secondarily induced disease of its secreting surface.—*Med. Gazette, July 25, 1851, p. 138.*

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## 65.—ON BRIGHT'S DISEASE OF THE KIDNEYS.

By Professor Christison. (From his Clinical Reports.)

[The usually considered pathognomonic symptom of Bright's disease is the coagulability of the urine. This Dr. Christison first considers. He says,]

In the first place, you must make sure that the coagulability is owing to albumen, otherwise there may be no Bright's disease, nor anything more than functional disturbance. Therefore you should always employ both heat and nitric

acid as tests; and the best way is to heat th
the coagulum resists nitric acid. Nitric aci
uric acid, when urate of ammonia is super
earthy salts when these abound; but a coa
nitric acid can be nothing else than albumen.
take it for granted that Bright's disease is po
urine contains albumen. The urine is albu
under pyelitis or cystitis, that is, inflammation
kidneys and bladder; because pus is freely th
whenever pus is secreted by a surface, serum
The urine is also apt to be albuminous for some
whatever may be its cause; for the relaxation of
the escape of blood, is seldom so quickly put a
for some time after blood has ceased to flow. A few days ago I saw a remarkable case of purpura hemorrhagica of the active kind in a gentleman of fifty, whose urine, two days after it had ceased to be bloody, was extremely albuminous. The action of a blister on the skin, if it irritates the kidneys or bladder, generally causes a temporary albuminuria, as I have again and again had occasion to ascertain. Mercurial action also is sometimes attended with functional albuminuria, which disappears permanently as the ordinary symptoms of mercurialism subside. In some individuals the use of certain articles of food, somewhat difficult of digestion, seems to cause a secretion of albumen from the kidneys for a very limited period. It is not uncommon to observe a very slight impregnation of albumen in the urine of confirmed dyspeptics, although no other sign of organic disease be discoverable, and the functional character of the affection is shown in the end by the albumen disappearing, at first from time to time, and at last for good and all. I have at present a lady under my care with dyspepsia, in whose urine there is sometimes oxalate of lime, sometimes a little sugar, sometimes a very little albumen, sometimes all three at once, sometimes none of these adventitious matters; nor does she present any other indication of organic derangement; and certainly there is no Bright's disease.

144 ...e causes which I have ... removal ... relieves ... intemperance, may ... are advised to ... ...y other occa... indigestion. ...ove not only ulceration ... Insidious ... form. chiefly ... it as ... mir its ...e,

There can be no doubt, therefore, that albumen may appear in the urine from other causes besides Bright's disease of the kidneys, and that sometimes it is a very trifling matter. But at the same time I would advise you to look carefully after all cases in which this symptom appears in connection with mercurialism, dyspepsia, or dietetic irregularities. Two of the most decided cases of Bright's disease that I have encountered, commenced during mercurial action, excited in the course of the treatment of pneumonia: dyspepsia is one of the most frequent of the early symptoms of obscure chronic cases of the disease; and, when albumen is readily made to appear in the urine by peculiarities of diet, there may be reason to suspect that the irritation thus excited in the kidneys is near akin to that which leads to organic degeneration, and may subsequently pass into it. A medical friend, who had been long a martyr to dyspepsia and neuralgia, but enjoyed otherwise tolerable health, once told me jeeringly, that we had over-rated the importance of albuminuria as a symptom of organic disease, because his own urine was never free of albumen. This statement, however, did not convince me of error; on the contrary, I thought that his dyspepsia, neuralgia, and dingy complexion might possibly be soon too well accounted for. Within two years he was seized with what was at first mistaken for bilious fever by his medical attendant, but which ended in gradual diminution of urine and fatal coma; and after death, the kidneys were found in a very advanced state of granular degeneration. So, too, a young graduate of this University, who was often made the subject of experiment by the late Dr. James C. Gregory of this hospital, in his inquiries into the quantity and density of healthy urine, and who could at any time impregnate his urine with albumen, by eating rather freely of cheese or pastry, fell about two years afterwards into decided Bright's disease, and died of it in no long time.

[The *Secondary Diseases* are very important, because they are chiefly those which destroy the patient, and are those requiring treatment generally. Some of these attend the acute, and some the more chronic forms of the disease. Dropsy is, perhaps, the chief, as its presence exasperates every other symptom, and its

the kidneys and the patient. Dyspepsia is another—in this attendant we The density of examine the urine in all cases of protracted and frequently-recurring tion of water. Obstinate chronic diarrhœa, sometimes fatal, either depending on happens when the intestine, or congestion and relaxation of the mucous membrane. 2ndly. The inflammations of the serous sacs, as pleurisy, pericarditis, &c.: these dations arise from exposure to cold. Bronchitis is always a source of additional misery to the patient. Affections of the head are not so common; but neuralgia of the extremities is a common and tormenting attendant of the chronic form. Concurrently with diseased kidneys do we generally find a diseased liver. In the same manner do we find hypertrophy and valvular disease of the heart. Dr. Christison does not think phthisis may be fairly regarded as a secondary affection. In speaking of the *causes* of Bright's disease, he says:

The causes of Bright's disease are obscure. The chief *predisposing cause* is intemperance; and it is probable that this agent may gradually induce the chronic form without the aid of any occasional cause. The scrofulous diathesis is another predisposition. I stated this in my treatise on granular degeneration of the kidneys in 1839 as a probable proposition; but there can be no doubt now, that the disease is one of the maladies of the scrofulous diathesis. A strong predisposition is also engendered for a short time by scarlatina. The tendency is sometimes indicated even in the primary fever, by the urine becoming coagulable; in many cases it breaks out with unequivocal symptoms about the close of the third week; but if the patient escape for another week, he is generally safe. Until lately, many physicians doubted the connection, insisted on by myself and a few others, between Bright's disease and the secondary disorders which follow scarlatina; but no accurate or unbiassed observer can well entertain any doubt now. The puerperal state is another predisposition, which has been established mainly by the observations made in this city by my colleague, Dr. Simpson, who meets with few cases of œdema in advanced pregnancy, or of convulsions at that period, or during delivery, without finding that the urine indicates serious renal disease. I have had several opportunities of observing the same facts, both in consultation with my colleague, and likewise with other obstetrical practitioners. There can be no doubt of the connection, and the discovery is of great practical importance, because in pregnancy, as in scarlatina, the occasional examination of the urine may enable the practitioner to foresee and provide for approaching formidable dangers. It has been supposed that other febrile poisons besides scarlatina may have the same effect of engendering Bright's disease, or a liability to it; also that it may originate in the sudden recession of extensive chronic cutaneous diseases. But on these two points, the facts hitherto collected are too few to be trusted. Age, sex, and station, are no farther predisposing causes, than in so far as persons of a certain age, station, or sex, may be more exposed than usual to other predisposing, and also to occasional, causes of the disease. I have seen it at the most advanced period of life, as well as at four years, and others have seen it in the new born; I have seen it often in the most comfortable, as in the most miserable, stations of society; and women are quite as prone to it as men. But without doubt it is proportionally more frequent in persons of middle life among the working classes of the community, than in any other circumstances. Of the *occasional causes*, which have been indicated by various authors, the most unquestionable and most frequent is exposure to unusual cold. It is remarkable how often the acute form of the disease is distinctly referred to some decided exposure to cold; and I do not know a more frequent variety of such exposure than sitting down, while overheated, on the grass or a stone. I think I have observed some cases to arise during mercurial action, without any other apparent occasional cause; and Professor Gluge found it by experiment to be produced by mercurialising dogs. Martin Solon says he has traced it sometimes to blows on the loins; a very probable cause, but one which has never come under my own notice. Gluge has further ascertained, that one pathological form of the disease may be produced in dogs by confining them to a too fatty diet: which has therefore been inferred to be a possible cause in man also. Dr. George Johnson found it to arise in animals kept closely confined in dark apartments, with little opportunity of exercise; which has been supposed to be an analogous connection with what is observed between this disease and the dingy confined habitations of the lowest

orders of society. Finally, it is very probable that several of the causes which I have regarded above as merely predisposing agents, more especially intemperance, may develope the more insidious cases of the chronic form, without any other occasional cause; and that both scarlatina and the puerperal state may prove not only the predisposing, but likewise the occasional cause, in exciting the acute form.

[The *prognosis* may be said to be unfavourable. Some look upon it as desperate; others as fatal in the end, though often exceedingly deceptive in its symptoms. Though Dr. Christison thinks many cases admit of a radical cure, and others may be brought to a stand-still for a long period. It is more favourable after scarlatina in pregnancy, or near delivery. Recovery is rare in the intemperate and strumous, and in those cases arising from fatty degeneration of the kidney.]

The unfavourable primary symptoms are, a scanty, pale, light urine, a very leucophlegmatic or dingy countenance, a chronic progressive emaciation, and above all a constant drowsy listlessness. A great proneness to secondary affections—especially to severe neuralgia, diarrhœa, chronic vomiting, and frequently dropsy—is also unfavourable; the conjunction of diseased liver or heart is always of evil omen. Dropsy for the first time, is not always an unpropitious sign; neither is bronchitis; and acute serous inflammations are no farther unfavourable, than by reason of their own proper risks, and the comparative difficulty of curing them when the kidneys are at the time diseased. It is particularly observable that all intercurrent diseases are more unmanageable and more apt to prove fatal in consequence of the renal disorder. The most mortal of all signs are, a very scanty urine of very low density, and an extremely impoverished condition of the blood-corpuscles, and stupor verging gradually towards coma.

*Morbid Anatomy and Pathology.*—The most important morbid appearances in the kidneys are, in the early stage of acute cases, the signs of bloody congestion, both outwardly and in their intimate structure: in advanced cases of the same nature, enlargement; for the most part a lobulated, botryoidal, or granular, yet sometimes too a uniform surface, with injected reticulations of vessels in the hollows; and internally an invasion of the cortical and medullary structures, and diminution of their usually distinct striated appearance, in consequence of the effusion of a heterologous matter, generally of various tints of yellowish white, into which the material of an injection passes very imperfectly or not at all. In chronic cases, we may have the same appearances as in advanced acute cases. But often we find the kidneys not enlarged, sometimes even less than usual, occasionally atrophied to an extreme degree. Some have thought the atrophied state may be secondary to a state of enlargement from morbid deposition, this being subsequently absorbed; others conceive that atrophy may commence with the beginning of the disease; nor is it an easy matter to settle that question. In very slow cases, the adaptation of the constitution to the gradually degenerating structure of the kidneys may be such, that the patient is not cut off until there remains only a single tubular tuft in the medullary part of one kidney, and two, or perhaps a third, in the other. I have seen one kidney completely atrophied, and without any natural structure visible, and in the other an extensive heterologous deposit, leaving only two medullary tufts visible in a longitudinal section.

These morbid appearances are liable to many variations, which it is very difficult to describe, because it is not easy to define them. I must refer you for details to the original description of Dr. Bright, as well as that in my own treatise, and above all to the accurate delineations of Dr. Bright, or M. Rayer in his work on diseases of the kidneys.

Dr. Bright and his immediate successors were content with ascertaining the anatomical characters of the disease, so far as they could be ascertained with the unaided organs of sense. The result was a suspicion which was strongly expressed by myself as well as others, that "future pathological research will probably show that there is more than one organic derangement" of structure concerned in producing Bright's disease. The fact is so. But it could scarcely have been proved without the aid of the microscope; which in this, as in other departments of pathology, has lately supplied most valuable information. It would take up too much of our time, were I to give you a detailed statement of the separate results which have been arrived at by the various microscopic observers who have successfully

studied the subject. The principal observers have been Gluge, Goodsir, Johnson, Simon, Toynbee, and Gairdner. The most original observations are those of Gluge. The others coincide with him in all very essential points; but there are material differences in the views taken by each of some of the details; nor is this wonderful, considering the fallacies to which the microscopist's eye is subject, when he attempts to pierce deep into the minutiæ of organised structures. There is, however, a satisfactory coincidence of observation on the whole. And upon collating all the microscopic inquiries yet published with one another, and trying them by such opportunities as have occurred to me, I think we may arrive at a consistent doctrine, and one which is tempting alike in a theoretical point of view and in its practical bearings. I shall now state this doctrine in a series of propositions. You are not to suppose I insist on these as matters of assured medical faith; but I already regard them as probable; and it is therefore well to have them distinctly enunciated as the basis of future investigation.

1. The congeries of alterations of the kidneys, described by Dr. Bright and his more immediate followers in this line of inquiry, depend on at least two distinct morbid processes.

2. One of these is of the nature of inflammation, chronic or acute. The other is a morbid degeneration, always chronic, not inflammatory, analogous to what occurs in various other important organs, and consisting of the morbid accumulation of oil or fat globules.

3. The inflammatory disease in its acute form, although known to originate under various circumstances, and even independently of any pre-existing disease, is best and most frequently exemplified in the phenomena which occur in many instances subsequently to scarlatina, or in the puerperal state.

4. The chronic form of the inflammatory disease always originates obscurely, insidiously, and so gradually that, except in favourable circumstances, it escapes notice for a long time. But it ought always to be looked for by a prudent practitioner in cases of protracted or frequently-recurring dyspepsia, diarrhœa, neuralgia, chronic rheumatism, catarrh, anasarca, and those chronic cutaneous diseases which exhaust the constitution. And it is apt to present itself intercurrently with most other chronic diseases of the greater viscera, especially phthisis, diseased liver, and hypertrophy of the heart.

5. The inflammatory process, according to most observers, consists in a preternatural formation of epithelial cells in the lining mucous membrane of the minute uriniferous tubes of the kidneys, and the detachment or desquamation of these cells; so that, by accumulating in the interior, they obstruct the tubes and choke them up. There are also found in the obstructing matter, blood discs, pus globules, uric acid crystals, and sometimes crystals of oxalate of lime. But the greater part of the mass consists of epithelial cells, entire, or much more commonly degenerated, so as to be irregular in their edge, contracted in size, or sometimes reduced actually to their nuclei. According to Gluge, the morbid formation rather consists of the more ordinary secretions of inflammatory action, such as fibrine, pus-globules, and exudation corpuscles; which not only accumulate in the uriniferous tubes, but are likewise thrown out in greater abundance throughout the surrounding interstitial texture.

6. The consequence is great obstruction to the secretion of the ordinary solids of the urine, and therefore a diminution of these solids, while the watery part may be long secreted as usual, or even in much more than the usual quantity. And the explanation of this interesting double phenomenon, which all must have often witnessed who are conversant with Bright's disease in practice, is that while the epithelial surface of the uriniferous tubes, considered by most physiologists to be the proper secreting tissue of the kidneys,—is grievously injured and diminished, the malpighian bodies,—supposed by some good authorities to secrete rather the watery part of the urine, remain for a long time little or not at all affected. This doctrine is a beautiful part of the pathological theory of the disease; but it rests on an insecure foundation, as several microscopic observers maintain they have seen the malpighian bodies oppressed by congestion within and pressure outside from the distended uriniferous tubes, at an early period of the morbid process.

7. As a result of the secretion of the water of the urine, the obstructed urine-tubes are often swept free of the obstructing material. But it does not always

follow that the tubes thus regain their secreting function; for they may have been permanently deprived of their epithelial cells no longer renewed, or only in diminished number and in a degenerated form.

8. But an important consequence of this sweeping out of the urine-tubes is that we find in the sediment of the urine their morbid contents; and these are blood-discs [Fig. 2, *a*], degenerated epithelial cells, much resembling pus-globules, and still more, mucous corpuscles (*b*), also nuclei of epithelial cells (*c*); and above all, as characterising this particular form or variety of Bright's disease entire or broken down casts of the urine tubes [Fig. 1, 2, 3, *d*], consisting of blood-discs, nuclei, and especially epithelial cells, all united together in cylinders, and portions of cylinders, by a transparent agglutinating medium, which can scarce be anything else than fibrine. This is one of the most important practical observations yet made in the course of the whole microscopic enquiry. For if exact, it enables us to discover most readily with the microscope, the nature of any particular case, and to refer it to inflammatory action as its fundamental source.

9. The other morbid affection of the kidneys, constituting also what is comprehensively called Bright's disease, is a peculiar degeneration, unconnected with any form of inflammatory action, and consisting in deposition of oil-globules in preternatural quantity in the epithelial cells of the urine-tubes, distending these cells, detaching them from the epithelium-wall, distending consequently the tubes by their accumulation, bursting the tubes here and there, and so escaping into the interstitial tissue.

10. The pathological consequences to the structure of the kidneys are here much the same as in the inflammatory form of the disease. The urine-tubes, gorged with oleiferous epithelial cells, become useless themselves in the process of secretion, and by pressure around impede the function both of the unaffected urine tubes and of the blood-vessels. The secretion of urine is therefore much disturbed, in respect of its proper solids, and often too its watery part; but sometimes the watery portion is unaltered, or even superabundant. And whether abundant or scanty, it sweeps out from time to time the morbid contents of the tubes—without thereby restoring, however, the healthy organisation of their basement membrane, or the healthy discharge of their function.

11. An important consequence, in a practical point of view, is that in the instance of oily degeneration, as in that of inflammatory deposition, the urine contains characteristic microscopic ingredients in its sediment. Detached oil-globules may be found, though they are difficult to detect, because they do not subside. But degenerated epithelial cells, loaded with oil-globules, and distended often to a considerable size, are more easily found [Figs. 4, 5, *e*]. And there are broken, as well as entire, cylindrical tube-casts consisting of oil-globules, and epithelial cells gorged with oil-globules, and all connected by a transparent and probably fibrinous matrix [*f*]. In this affection of the kidneys, the tube-casts present few degenerated epithelial cells, in which there are not many oil-globules. In the inflammatory affection again, oil-globules are either wanting altogether in the degenerate epithelial cells, or at all events they are very scanty and minute. Oil-globules are always easily distinguished from nuclei, blood-discs, and epithelial cells, by their rounded uniform shape, and their broad black margin, produced optically by their strong refracting power.

12. Such are the pathognomonic characters by which the two very different organic alterations of the kidneys may be distinguished during life. But the two affections may concur. After the inflammatory form has subsisted for some time, and many urine-tubes have become gorged, or empty and functionless, oil-globules may be secreted into the empty ones, together with a fibrinous matrix; so that oleiferous tube casts may be afterwards seen in the sediment of the urine, as well as those which are simply inflammatory. Dr. Johnston first noticed this combination; Dr. Gairdner has observed it often; I saw it several times during last spring clinical course; and some have suspected it to be so frequent as to render a diagnosis between the two forms of organic disease for the most part impracticable. I am satisfied, however, that the two affections do occur independently of one another; and in particular I have repeatedly seen sediments presenting invariably the inflammatory character, or at least with only a few oil-globules in the degenerated epithelial cells. The occurrence of a few small oil-globules is no

true source of confusion; because, according to the best observers, the healthy epithelial cell is not without a few of them.

13. To the affection which consists of fatty or oily degeneration, Gluge has given the unexceptionable name of *stearosis*, which expresses a fact but no theory. The nomenclature of the other affection is not so easy, and has not been so lucky. It has been called *desquamative inflammation*, because it consists essentially of inflammatory action, causing the epithelial cells to scale off the mucous membrane of the uriniferous tubes. But there is equally scaling of these cells in the oleaginous degeneration. So that if this process is to enter at all into the nomenclature, the one disease should be called *stearotic*, and the other *inflammatory*, desquamation. I do not think, however, that these terms will be long thought quite accurate, or if accurate, altogether convenient. But I shall use them in the sequel, without pledging myself to their exactitude.

The observations which have come under my notice since becoming acquainted with these microscopic inquiries, bear out on the whole the conclusions stated in the preceding propositions. During especially my period of service as Clinical Professor last spring, there were many excellent subjects of study in these wards, and the opportunity was not neglected. Of seven characteristic cases of Bright's disease, which we were able to observe for a considerable period, only one presented the characters of stearosis, four those of the pure inflammatory form, and two the mixed characters of both affections, in which, however, the inflammatory tube-casts and epithelial cells were greatly more prominent than the stearotic. My experience at that time, in conformity with what I have observed since, leads to the conclusion that the inflammatory is much more common in this city than the stearotic form of renal disorganisation,—Edinburgh differing in this respect from London and Brussels, where stearosis seems proportionally more frequent, but corresponding with Paris, in which that degeneration seems comparatively rare. Our case of stearosis was the only fatal one; and this variety is probably always fatal.

*Case* 1.—The first is an instance of inflammatory desquamation, commencing, like that of Flint, in the hospital during treatment for another disease, and subsequent mercurialization. The subject was a labourer of 22, William M'Millan, who had been cured of jaundice and diarrhœa a twelvemonth before in this hospital, and was again attacked, fourteen days before admission, with the same unusual combination of diseases. When admitted on January 11th, 1850, he had no jaundice, but frequent watery diarrhœa, some pain across the lower belly, occasional vomiting, a sallow complexion, and considerable debility. The lungs were healthy, so was the heart, and the pulse was little excited; the liver was not enlarged; and the urine was ascertained at the beginning to be "natural in colour, without deposit, and not coagulable." Dr. Bennett, who was then on duty, treated the case with leeches, calomel, and opium, till the mouth became slightly affected, then with catechu and potash, and also one blister over the liver, which was subsequently the seat of pain and some tenderness. When I took charge of the wards on February 1st, he was considerably better; and he continued to improve under the use of bismuth, opium, and hydrocyanic acid. On the 20th February, his feet appearing somewhat œdematous, the urine was examined, and found to have become turbid even when just passed, very strongly albuminous, 1025 in density, not particularly scanty, and abounding with degenerated epithelial-cells [Fig. 1, *b*], and urine tube-casts [*d*], which for the most part presented the inflammatory characters, but occasionally a few globules of oil. Under the use of cupping over the loins, Dover's powders nightly, and the warm bath every other evening, he slowly improved, sweating every night, and nevertheless passing daily from 70 to 90 ounces of urine between 1017 and 1019 in density. Repeated examination of the urine showed continuing coagulability, abundant fragments of inflammatory tube-casts, very seldom containing any oil-globules, but occasionally octaëdres of oxalate of lime. In the beginning of March, it was for the first time observed that the abdomen contained fluid; and from that time a moderate ascites continued to be the predominant dropsical affection. Gallic acid was now tried in the dose of three grains thrice a day, but with no decisive benefit; nor did the acid ever appear in the urine. The man remained in the hospital till the middle of April, when he became tired of his slow progress, and left it for the country. The urine had been for some

Fig. 1.

time 120 ounces daily, without the use of diuretics; it was 1018 in density, and moderately coagulable; and the sediment showed degenerated epithelial cells and broken-down tube-casts, always of the inflammatory kind. The œdema had been removed, except that the ankles swelled a little at night; but the ascites had not altogether disappeared. I have not heard of him since; but his state at dismissal was obviously very precarious.

It is clear, from the precursory jaundice and supervening ascites, that although the liver was not enlarged, the affection of the kidneys was combined with an older disease of that organ; and in all probability this circumstance accounts for the little impression made on the renal disorder by treatment, and it certainly added greatly to the man's jeopardy.

*Case* 2.—Not so with the next patient, who, as I consider, was radically cured of an uncomplicated attack of the purely inflammatory form of Bright's disease, occurring in connection with the puerperal state. This was a young woman, Elizabeth Birnie, 21 years of age, who had been delivered in the Maternity hospital, without any accident, on the 25th January, 1850, and was transferred to this hospital on the 8th February. For four weeks before her confinement she suffered from frequent scanty micturition, without any other complaint; and five days after delivery the limbs began to swell. When she became my patient, the face was puffy and very leucophlegmatic; the legs were œdematous as high as the knees, and pitted on pressure; the abdomen was rather full, but without distinct evidence of a fluid in it. There was general tenderness of the abdomen, but none particularly in the loins or across the epigastrium. The heart was sound; so too seemed the liver; and there was only a slight catarrh. She had just ceased to nurse her child, and the milk flowed freely. The urine was scanty, dusky, cloudy when newly passed, acid, 1017 in density, and highly coagulable. She had a trivial fever, the pulse being 96, but small, and the skin dry, and in the night time hot. She was ordered bitartrate of potash, spirit of nitrous ether, and Dover's powder. In three days the œdema had disappeared without increase of urine. The sediment of the urine consisted of blood-discs (Figs. 2 and 3, *a*), degenerated epithelial cells (*b*), epithelial nuclei (*c*), and casts of the uriniferous tubes (*d*), filled with the preceding substances, and seldom any oil granules. The sediment was frequently examined afterwards, and presented little variety, except in amount, and in presenting a few tube-casts consisting apparently of the fibrinous matrix alone (Fig. 3). The diuretics were then discontinued, and Dover's powder was administered twice a day. Notwithstanding the opium, a tendency to diarrhœa occurred for four days after the 14th, but it was stopped by increasing the opium. The features having again become puffy, nitrous ether and oil of juniper was given; but, in consequence of the urine becoming more red and more

FIG. 2.

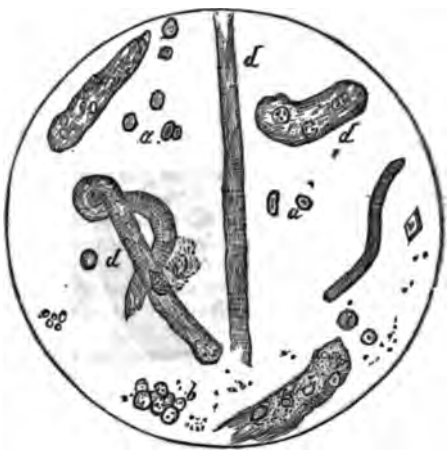


FIG. 3.

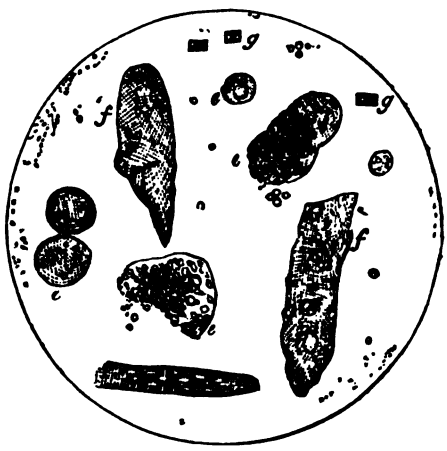
coagulable, all diuretics were permanently abandoned. On the 20th, she began to complain of pain and tension of both eyeballs, and in the course of a few days the sclerotic of both eyes became very œdematous and swelled over the cornea; but this new affection was quickly removed by a zinc wash. On the 24th, vomiting before breakfast occurred for a few days, and diarrhœa threatened to return. Both affections, however, were arrested by morphia. Meanwhile a gentle perspiration had been maintained pretty steadily every night by Dover's powder. On the 27th the improvement was very marked in every respect. The pulse had become natural; there was no œdema; the urine, which had never exceeded thirty ounces, had a density of 1017, much less turbidity and brownness, and much less coagulability; and her sense of general comfort was greatly increased. Three grains of gallic acid were then ordered three times a day, but without seeming to pass by the urine, until the doses were doubled, when it was easily detected by the salts of iron causing a bluish-black precipitate. On the 6th March, the urine was forty ounces in quantity, 1015 in density, less turbid, and no longer red or brown.

From this time there were occasional fluctuations, but on the whole an appreciable amendment, until the 31st March, when the urine presented very few tube-casts, little turbidity, and little albumen; but for three days the potash test indicated the presence of some sugar, although the density was only 1012. On April 16th, there was only a mere trace of albumen; and on the 30th none. On the 16th May, she was dismissed. The albumen had never returned; the urine had been constantly clear, abundant, from 1019 to 1022 in density, without sugar and tube-casts. She had become florid, sufficiently plump, vigorous, and active, and she had the appearance of perfect health. I have not heard of her since.

Every circumstance here unites to prove this a case of subacute inflammatory desquamation of the uriniferous tubes. It may fairly be held an instance of complete cure, accomplished mainly under the influence of diaphoretics. Diuretics certainly seemed to be injurious, on at least one occasion; but this is the only instance in which these remedies have ever appeared to me to aggravate the symptoms. I have met with various cases of the same kind in the same circumstances, most of them equally favourable in the result. Another will be detailed under the head of the treatment.

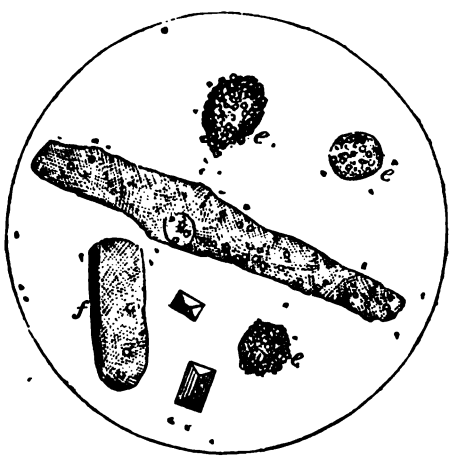
*Case* 3.—To these I shall only add for the present one case of the other form of Bright's disease. Frequent examination of the urine constantly presented characteristic microscopic fields of oleiferous epithelial cells, and oleiferous tube-casts. If the doctrine sketched above were good for anything, there could be no doubt of the intimate condition of the kidneys. And accordingly they displayed, after death, appearances which Professor Gluge and Dr. Johnson themselves could not desire to see surpassed. The patient was a labourer, James Wood, aged 35, admitted into the surgical department of this hospital for necrosis of the left thigh-bone, but transferred to the clinical ward in a few days with coagulable urine and ascites. In November, 1849, while suffering for some weeks from pain along the left thigh and lameness, he was seized with rigors, in consequence of sitting in a chilly apartment without a fire. Swelling of the abdomen and limbs followed. Little further information could be obtained of the progress of his illness. When admitted into the infirmary, there was a sinus of the lower part of the left thigh, communicating with the necrosed femur. When received into the clinical ward, he had moderate œdema of the limbs, slight ascites, trivial catarrh, a sallow countenance, considerable emaciation, little appetite, much thirst, a frequent feeble pulse, and great debility. The action of the heart was barely audible, but otherwise natural. The urine was moderate in quantity, 1012 in density, without sediment, and distinctly coagulable. Dr. Bennet, who then had charge of him, relieved the catarrhal symptoms with squill and opium, and the dropsical effusions, first by Dover's powder, and afterwards by bitartrate of potash. But nevertheless he got constantly weaker and weaker, and became subject to vomiting in the morning, which bismuth, however, seemed to relieve. Soon after taking charge of the wards, I found him, on Feb. 7th, 1851, extremely weak, with a thready pulse, and coldness of the feet and hands. There was again anasarca of the legs, and now also of the scrotum, a little ascites, no great bronchitis, but a labouring respiration, and vomiting before breakfast. The urine was fifty ounces in quantity daily, 1015 in density, cloudy when just passed, slightly albuminous, and abounding in lithates and phosphates. It had been necessary to order him both wine and spirit, on account of his extreme weakness. In a few days the urine was more carefully examined, when it was neutral, and free from both phosphates and lithates, but otherwise in the same state as before. The sediment presented many epithelial cells enlarged and gorged with oil globules (Figs. 4 and 5, *e*); numerous casts of the uriniferous tubes, entire or broken, and full of oleiferous epithelial cells and independent oil-globules (*f*); and also occasionally a few octaëdral crystals of oxalate of lime (*g*). On February 18th, as there was more œdema and dyspnœa, squill and digitalis were substituted for bitartrate of potash, and with the effect of increasing the urine. A mixture of chloroform and spirit of ammonia greatly relieved his breathing. Creasote often checked the liability to vomiting. But, although the urine was soon raised to 120 ounces daily, the dropsical effusions did not for some time recede. At length they began to give way. On March 7th he was every way better; and on the 20th, the urine having been for three weeks at 120 ounces daily, there was very little œdema of the limbs, no ascites, no

Fig. 4.




catarrh, no vomiting, and a tolerable appetite; but still he remained very weak, and seemed to be picking up little strength, and no flesh. Afterwards a watery diarrhœa returned, and became gradually more and more attended with vomiting. On April 7th, both of these affections were urgent, in spite of acetate of lead with opium, catechu, morphia suppositories, and creasote. Consequently the exhaustion soon became extreme, and ended fatally on the 15th. For four or five days before death the urine did not exceed ten ounces daily, yet to the last there was no coma.

Fig. 5.




On dissection, the kidneys were found somewhat enlarged, their surface mottled with little vascular patches, their interior mottled irregularly with deep grayish-purple spots on a light fawn ground, the medullary part highly injected. Opaque yellowish granular spots were visible on many parts of a longitudinal section. The fluid scraped from the surface of a section presented before the microscope oleiferous epithelial cells (Fig. 6, *e*), and oleiferous tube-casts (*f*), exactly like the sediment of the urine examined during life. Thin sections of the medullary part of the kidneys made with Valentine's knife, both in the direction of the uriniferous tubes (Fig. 7), and across them (Fig. 8), showed these tubes everywhere gorged *with oil-globules*, while the malpighian bodies seemed free of such obstruction

Fig. 6.

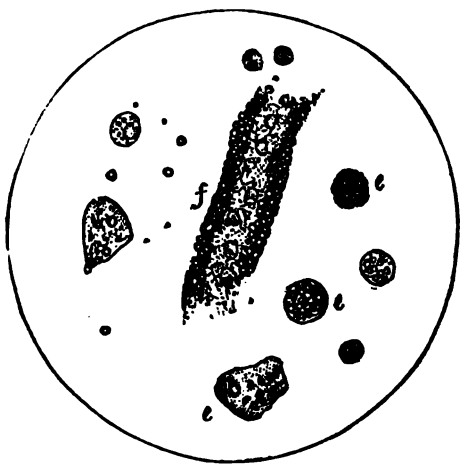
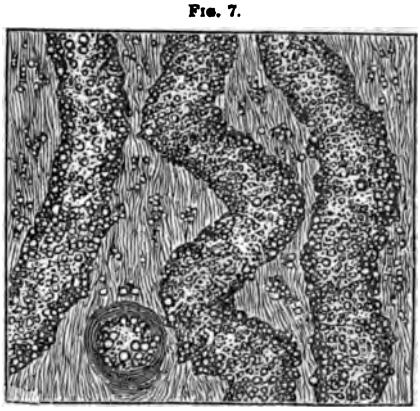



Fig. 7.

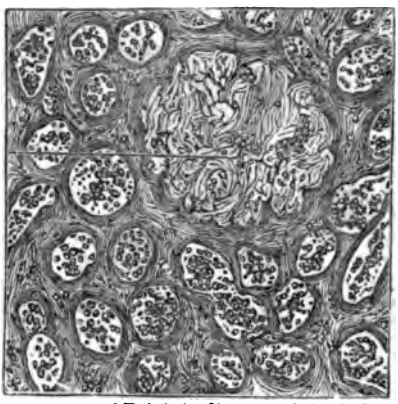


(Fig. 8, *i*). The super-renal glands were enlarged. The mesenteric glands had a bluish marbled appearance. The intestinal mucous membrane was everywhere thickened, and its folds were in many parts dark brown, but there was no ulceration. The spleen was enlarged and firm. The heart was rather small and pale, the endocardium opaque, the aorta atheromatous at its commencement. The lungs were somewhat emphysematous, and presented here and there, especially just under the pleura, nodules of condensed pulmonary tissue, about the size of a cherry stone, grayish-purple in colour, generally softened in the centre, and passing insensibly into the surrounding healthy texture. The left femur presented interesting appearances; but as they were those of necrosis generally, they need not be detailed here.

The appearances in this case were characteristically those of stearosis of the kidneys. I endeavoured to ascertain by chemical analysis, whether oil could be obtained from the kidneys in proportion to the microscopic indications. An accident prevented the weight of oil from being determined, but it was plainly much greater in proportion than in a comparative analysis of a healthy kidney. From the first the symptoms presented a character of *adynamia*, which could not be referred to the necrosis merely, but seemed to betoken the presence of a malignant disease. The abundance of the watery part of the urine, and the facility with which it was very much increased, together with the want of oily degeneration of the malpighian

bodies, rather favour the notion that these bodies are concerned less with the proper secretion of the kidneys than with the secretion of watery fluid.

Fig. 8.



*Treatment.*—The treatment of Bright's disease of the kidneys is partly directed to the removal of the fundamental disease, and in part to the cure of secondary diseases.

The main remedies for the fundamental disease are general depletion, topical depletion, local counter-irritation, diaphoretics, diuretics, and astringents. In acute cases general bloodletting is an essential measure, if there be decided general re-action; and in the young, robust, and plethoric it must be practised freely, as in ordinary acute inflammations. Local depletion is resorted to in subacute cases, or when the constitution is impaired, but, according to my observation, not with the advantage we might expect, unless its amount produces a general impression. Counter-irritation of the loins is probably too little resorted to. It is improbable that any benefit can be derived from depletion and counter-irritation in stearosis, uncomplicated by inflammatory desquamation. In all cases, acute or chronic, stearotic or inflammatory, diaphoretics are of essential service. The best are Dover's powder, the warm bath, warm clothing, and, for convalescents especially, a moderately warm climate. Diaphoretics have always appeared to me most serviceable when they are so given as to excite a gentle perspiration during a part of the night. Diuretics are seldom necessary for the fundamental disease; but they are sometimes advisable when the urine becomes very scanty, even although there is no dropsy; and they are undoubtedly the most certain and speedy remedy when the dropsical effusions are considerable. I am convinced that the fears entertained by some of injury being produced by the stimulus of diuretics on the kidneys are visionary. Case 2d is the only instance in which I have ever witnessed any apparent harm; and in numberless instances, as in case 3d, I have seen dropsy quickly removed by diuretics, not only without increase of the other symptoms and secondary affections, but likewise with manifest improvement in them all. The stimulus caused by diuretics may well be supposed to differ entirely from the peculiar irritation which gives rise to inflammatory or stearotic desquamation; and in that case the induction of the one may not of necessity tend to induce, keep up, or increase the other. Besides is there no likelihood of advantage from diuretics sweeping out the tube-casts, and other matters obstructing the uriniferous tubes? The best diuretics, in my experience, are digitalis, squill, and bitartrate of potash taken simultaneously. Nitrous ether, broom tops, acetate of potash, oil of juniper, have seldom succeeded in my hands when the three former failed; but after all these had failed, I have seen diuresis speedily established by Hollands. I doubt whether astringents, even in chronic cases, are of the service which we might expect. I have seen a few cases in which the albuminous impregnation ceased under the use of acetate of lead, or under that of gallic acid; but the good effects have not been so frequent as to entitle me to speak positively in their favour.

The treatment of secondary diseases does not materially differ from that which is applied to the same diseases in other circumstances. All of them are more difficult of cure when secondary to Bright's disease. Inflammations must be treated with activity in the usual way. I repeat that, after frequent careful watching, I can find no objection to the use of diuretics for removing dropsy, but quite the reverse; but in this affection we should avoid the cathartic plan, as being apt to excite a permanent diarrhœa; and mercury should be shunned as a mercurial on account of the facility with which in this disease it produces excessive action. The best remedy for the diarrhœa, which so often proves troublesome, and sometimes dangerous in Bright's disease, is the Edinburgh lead and opium pill, in the dose of five or ten grains twice or even thrice a-day; to which may be added, in severe cases, a fatty suppository of muriate of morphia. Vomiting may be sometimes removed by bismuth, but more frequently by morphia, hydrocyanic acid, creasote, pyroxylic spirit (medicinal naphtha), chloroform, or little fragments of ice; and when these fail, a blister over the epigastrium has sometimes succeeded. It is not necessary for me to say anything of the treatment of other secondary diseases. In all cases stimulant liquors should be used with caution; but they are sometimes unavoidable when the exhaustion is great. The diet, in the acute form, must be low, light, and farinaceous; but in the chronic form a moderate allowance of nutritive easily digested food, with a moderate use of liquids, has always appeared to me the preferable diet, when the patient can take it.

Bright's disease was long considered a very deadly one; indeed as generally fatal, sooner or later. This denunciation is probably true of the stearotic form. But it is quite incorrect, if extended to the more frequent form of inflammatory desquamation.—*Monthly Journal of Med. Science, June*, 1851, *p.* 551.

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66.—*A Few Hints in Treating Urinary Affections.*—By Dr. Golding Bird, F.R.S., &c.—[Dr. Bird concludes his work on the above subject by the three following rules.]

1. Whenever it is desirable to impregnate the urine with a salt, or to excite diuresis by a saline combination, it must be exhibited in solution, so diluted as to contain less than 5 per cent. of the remedy, or not more than twenty-five grains in an ordinary draught. The absorption of the drug into the capillaries will be ensured by a copious draught of water, or any diluent, immediately after each dose.

2. When the urine contains purpurine, or presents other evidence of portal obstruction, the diuretics or other remedies employed should be preceded or accompanied by the administration of mild mercurials,—taraxacum, hydrochlorate of ammonia, or other cholitic remedies. By these means, or by local depletion, especially by leeches to the anus, the portal vessels will be unloaded, and a free passage obtained to the general circulation.

3. In cases of valvular disease, or other obstructions existing in the heart and large vessels, it is next to useless to endeavour to excite diuretic action, or appeal to the kidneys by remedies intended to be excreted by them. The best diuretic will, in such cases, be found in whatever tends to diminish the congested state of the vascular system, and to moderate the action of the heart; as digitalis, colchicum, and other sedatives, with mild mercurials.—*Brit. and Foreign Medico-Chirurg. Review, July*, 1851, *p.* 243.

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## 67.—OBSERVATIONS ON THE PHYSIOLOGICAL RELATIONS OF OXALATE OF LIME.

By Professor Lehmann.

Frequently as oxalic acid, combined either with the alkalies or with lime, occurs in the vegetable kingdom (Schleiden, Carl Schmidt, and others), it is very seldom found in the animal organism, at least in large quantities. It only occurs in the latter in combination with lime, never being present in sufficient quantity to com-

bine with the alkalies as well as with lime. Moreover, it is much more frequently met with in pathological than in physiological conditions.

It is in the urine that the presence of oxalate of lime has been most frequently observed. It was for a long time regarded as a morbid product in this fluid; but independently of the circumstance that this body is constantly present, together with carbonate of lime, in the urine of herbivorous animals, it has frequently been found in normal human urine by myself, Höfle, and others.

In examining microscopically the morning urine of healthy men, I have frequently discovered isolated crystals of oxalate of lime; this is not, however, always the case; and further, the oxalate of lime recognisable in such cases by the microscope, is not all that is contained in the urine, for it forms in larger quantities after some time, and during the acid urinary fermentation, so admirably described by Scherer. After allowing morning urine to stand for a considerable time, we often find a great many of these crystals, when the perfectly fresh urine presented no trace of them. The following is an excellent mode of demonstrating the existence of oxalate of lime in normal urine. If it be winter, we must expose fresh urine out of doors till it freezes; in this process, as in the freezing of wine and vinegar, a great part of the water crystallises in a comparatively pure state, and after its removal we obtain a concentrated saline solution, in which microscopic crystals of oxalate of lime may be discovered. That oxalate of lime is at first actually held in solution in filtered urine, and that it does not, as C. Schmidt supposes, proceed from the mucus of the bladder, is a view which is supported by the experiment which I have often repeated, that in urine, which after thoroughly cooling was freed from its mucus and urate of soda by filtration, the most distinct crystals of oxalate of lime might, after a time, be recognised, while no traces of them could either previously be detected in the mucus of the fresh urine, or found after the residue on the filter had been for some time in contact with water. The oxalate of lime with a few crystals of uric acid, does not separate from filtered urine until after it has stood for some time. We may very easily convince ourselves that oxalate of lime is present in a state of solution, by extracting the solid residue of filtered urine with not too concentrated spirit, and agitating the spirituous extract with ether; after the extraction with ether, there may be observed, in the alcoholic extract, a sediment insoluble in water, which consists of the most beautiful crystals of this salt. While in the acid urinary fermentation the separation of the oxalate of lime increases with the augmentation of the free acid of the urine, in the latter case the salt is separated by the removal of the free acid.

The quantity of oxalate of lime in ordinary urine is so minute, that, till recently, chemists, from the want of sufficiently accurate means of analysis, were unable to recognise it; good analysts have, however, always found, in the insoluble part of the ash of the extract of urine, a little carbonate of lime, which, at all events, owes part of its origin to the oxalate of lime.

Crystals of oxalate of lime are most frequently found in the urine after the use of vegetable food, especially of such kinds as contain ready formed oxalates (Wilson). Donné found that after the use of sparkling wines, the quantity of the salt is increased in the urine; and my own experiments show that there is an increased secretion of oxalate of lime after the use of beer containing much carbonic acid, and of the alkaline bicarbonates and vegetable salts. I cannot confirm Bird's view, that highly nitrogenous food causes a precipitate, or even an augmentation of the oxalate of lime. It is often found in the urine of pregnant women. (Höfle.)

From a series of direct experiments on the subject, C. Schmidt is led to deny that oxalate of lime introduced into the stomach passes into the urine; and in this point I can perfectly confirm him, without, however, going so far as to assert that the food exerts no influence on the formation of this body. In the excrements of caterpillars we often find much oxalate of lime which is not formed directly from the ingesta, since I have very often found the crystals in the biliary ducts of these animals. Preparations can be easily made of these organs; and in consequence of their contractility, a large quantity of their contents may be expressed from the cut tubes, and submitted to microscopic examination.

With reference to the occurrence of oxalate of lime in certain morbid conditions,

Prout, Bird, and others, make very different statements, none of which are yet fully established. Numerous examinations of morbid urine have convinced me, that in this country, at least, the sediments of oxalate of lime are much rarer than they are represented to be by English writers. These investigations have led me to the following results: when the respiratory process is in any way disturbed, we most frequently observe a copious excretion of oxalate of lime; it is most common either in fully developed pulmonary emphysema, or when the pulmonary tissue has lost much of its elasticity after repeated catarrhs; on the other hand, it is not present nearly so often in inflammatory or tuberculous affections of the lungs (Höfle); moreover, it is common in convalescence from severe diseases, as, for instance, typhus, mucus-corpuscles being then often associated with a trifling sediment of oxalate of lime. I have only met with actually pure sediments of this salt in three persons, who sometimes (at somewhat considerable intervals) suffered from epileptic attacks. It is by no means constant, according to my experience, in the urine of rachitic children (Simon), of gouty adults with osteoporosis, of women with leucorrhœa, of patients with heart-disease, or in urine containing semen. (Donné.)

In the dyspeptic conditions in which Prout and Bird have found sediments of oxalate of lime, I have failed in discovering anything of the sort; on the contrary, I have generally found the sediments in the urine of such patients to be free from these crystals. The reason why the English have so often found this salt in the urine, may be, that in England (as we shall further notice at a future page) the urine is generally in a more concentrated state than in Germany; and as Bird very correctly remarks, oxalate of lime is more rapidly separated from a concentrated than an aqueous urine. Moreover, experience at the bedside teaches every unprejudiced observer, that the appearance of oxalate of lime in the urine, is by no means accompanied by the group of symptoms which certain English physicians describe as pertaining to what they call the oxalic diathesis.

That the mulberry calculus consists for the most part of oxalate of lime, has been long known; but most other urinary calculi, whether they consist principally of earth or urates, almost always contain a little oxalate of lime.

This salt has only rarely been found in other places besides the urine. C. Schmidt has remarked that it is often present in the mucus of the gall-bladder, and that it is scarcely ever absent from the mucous membrane of the impregnated uterus. I once discovered oxalate of lime in expectorated matter; but whether it was produced from the pulmonary mucus, or from fragments of food in the mouth, I could not decide.

*Origin.*—As the use of vegetable food, of which many varieties contain oxalates, increases the quantity of oxalate of lime in the urine, the inference would seem a legitimate one, that the oxalates are transmitted from the food to the urine. The source of this salt must, however, not be sought for only in the preformed oxalates, but in the amount of alkalies in combination with vegetable acids present in the food; for as we have already mentioned, they induce an augmentation of the oxalate of lime. In all the well-marked cases to which I have alluded, the increase of the oxalate of lime seemed to be combined with disturbance of the respiratory process. Thus it may be easily understood why, after the use of drinks rich in carbonic acid, of alkaline carbonates, or vegetable salts, oxalic acid is increased in the urine; the superfluous carbonic acid which has entered the blood, or been generated there from the salts of organic acids, must obstruct the absorption of oxygen and the perfect oxydation of certain substances in the blood; hence also the quantity of oxalate of lime has been found to be increased by the partially impeded exchange of oxygen and carbonic acid in the lungs, consequent on emphysema, pulmonary compression during pregnancy, &c. We might, in such cases, assume, according to a formerly prevalent belief, that the kidneys in some degree acted vicariously for the lungs, since under the form of oxalic acid they remove from the organism the carbon which the latter organs would have excreted as carbonic acid.

Although certain chemists hold a contrary opinion, it is an undoubted fact that the nervous system has an influence on the oxydation of the blood. The occurrence of oxalate of lime in cases of epileptic convulsions, in convalescent persons, &c., might be referred to the disturbance induced in such cases in the nutrition or in the function of the nervous system, and to its diminished influence on the pro-

cess of respiration, without there being any necessity for the assumption of a special diathesis.

It seems, moreover, unreasonable to set up such a diathesis, since the establishment of a special disease from a single symptom—that symptom being only the occurrence of oxalate of lime—is entirely opposed to the spirit of rational medicine.

From Wöhler and Liebig's discovery, that uric acid is decomposed by peroxide of lead into urea, allantoin, and oxalic acid, it has been pretty generally assumed, that the oxalic acid of the urine is due to an oxydation of the uric acid; the oxalic acid, in this case, not being converted into carbonic acid, as usually occurs in the healthy organism. That the formation of oxalic acid may be in part thus explained, is unquestionable; but there are many other substances in the animal organism besides uric acid, which by oxydation yield oxalic acid. No definite numerical ratio between the uric acid, urea, and oxalate of lime in the urine, has been yet established.

C. Schmidt has propounded a very ingenious view regarding the origin of oxalate of lime in the urine. He believes that we must seek for the source of its secretion in the mucous membrane of the urinary passages; the oxalate of lime is first produced by the decomposing action of the acid urine on a soluble compound, oxalate of albumen-lime, secreted by the mucous membranes; for oxalate of lime as an insoluble body, could not penetrate with the urine through a series of renal cells; oxalate of lime is also formed from the mucus of the gall-bladder by this mode of decomposition. When oxalate of lime occurs in the urine, we always find an augmentation of the mucus. These reasons do not, however, appear to be so decisive as to induce us to exchange the view we have already given for that of Schmidt; and, indeed, in another place, we find Schmidt himself maintaining that the urea is in part combined with oxalic acid.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 152.

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68.—*On the Means of Testing for Urea in Albuminous Fluids; and on the Origin of Urea.* By Professor Lehmann.—Urea may generally be very easily recognised by its properties, especially by its behaviour towards nitric and oxalic acids; but when we have to discover very minute quantities of this substance in albuminous fluids, it is often very difficult to determine its presence with scientific precision. It is in alcoholic extracts that we must always seek for urea; but before we proceed to search for it, there are several precautionary measures to be adopted, the neglect of which would render our attempt to discover it futile. In the first place, in reference to the presence of albuminous substances, if we wish to discover small quantities of urea in albuminous fluids, we must not be satisfied with the removal of the albumen by simple boiling; since, by the coagulation of the albumen, the fluid becomes more alkaline, and might, during evaporation, induce a decomposition of the urea; moreover, all albuminous matter is not precipitated by boiling, but a portion remains dissolved by the alkali, and is taken up in the alcoholic extract. On evaporation, this albumen undergoes a change, which probably cooperates with the alkali in inducing the decomposition of the urea. This may explain how it was that Marchand could only recover 0·2 of a gramme of urea from a mixture of 200 grammes of serum and 1 gramme of urea. Hence, before boiling the albuminous fluid, we must add a few drops of acetic acid, so as to give it a slightly acid reaction, whereby not only is the alkalescence of the fluid prevented, but a much more perfect separation of the coagulable matters is effected. If the residue of the fluid from which the coagulated matters have been filtered be extracted with cold alcohol, and the solution rapidly evaporated, so as to cause the chloride of sodium (taken up by the cold alcohol) to separate as much as possible in crystals, on then bringing a drop of the mother-liquid in contact with the nitric acid under the microscope, we shall observe the commencement of the formation of the rhombic octohedra, and the hexagonal tablets, in which, if the investigation is to be unquestionable, the acute angles (=82°) must be always measured. After the determination of the nitrate, we may also obtain the oxalate, and submit it to microscopic examination. A good crystallometric determination yields, however, the same certainty as an elementary analysis, which, in these cases, would never or extremely seldom be possible.

The investigations of Marchand have thrown much light upon this subject [the seat of the actual formation of urea]. This accurate observer could only recover 0·2 of a gramme of urea from 200 grammes of serum, to which 1 gramme of urea had been added. He shows that, even if the urea were only separated from the blood at the end of each successive hour, it could not have accumulated in such quantity as to have been discoverable by the present mode of investigation. The following consideration will give us an idea of the small quantity of urea which, according to Marchand's hypothesis, at the most can accumulate in the blood in one hour:—From the experiments of Ed. Weber, which I have in part confirmed, we may assume that there are, in an adult man, at most 6 or 7 kilogrammes [16 to 19 pounds] of circulating blood. Now, if, in twenty-four hours, 30 grammes of urea are discharged, at most only 1·25 grammes could accumulate in one hour in the whole mass of blood; so that only 0·021⅛ could be contained in it. This minute quantity can however, as we have already shown, only be detected in operating on very large masses of blood and by the aid of the microscope. Hence it is easy to understand why, during my experiments with an animal diet, while the urine was loaded with urea, none of this substance could be discovered in the blood.

If it be now established that the urea is not primarily formed in the kidneys, the question still remains to be answered, whether it is produced in the circulating blood or in the individual living organs, (as, for instance, the muscles,) and from what materials it is principally formed. In the present state of our knowledge, we may answer, that the urea is formed in the blood, and that it is produced from materials that have become effete, the detritus of tissues, as well as from unserviceable and superfluous nitrogenous substances in the blood. No animal tissue presents such vital activity, is so much used, and is so rapidly worn out, as muscular tissue; it is in this tissue that the metamorphosis of matter proceeds most rapidly and abundantly; and yet in the large quantities of muscular fluid on which Liebig worked, he could detect no trace of urea, although he found substances from which he could produce urea artificially. We must therefore assume, that these substances, as creatine and probably inosinic acid, are decomposed in the blood, by the action of the alkalies and of free oxygen, into urea and other matters to be excreted. Moreover, my experiments, showing that the superfluous nitrogenous food which enters the blood, and the fact that caffeine, glysine (Horsford), uric acid, and alloxantin (Wöhler and Frerichs), soon after they have been taken, perceptibly increase the amount of urea in the urine, support the view that urea is formed in the blood. It is impossible to suppose that this nitrogenous food is first converted into tissue, and subsequently into urea, &c.; for we cannot think that a process occurs here, analogous to that exhibited by the percussion-apparatus of the physicists, where a certain number of parts effecting a percussion give rise to the repulsion of an equal number of parts. Hence the conversion of this matter can occur in no other place than in the circulating blood, and therefore it is here that the urea must be formed.

That the urea is formed from nitrogenous matter could not be doubted, even if it did not contain nitrogen (and that in so large a quantity); for it is especially after the use of highly nitrogenous food, that we find an augmentation of its quantity in the urine. If, however, we should further inquire,—from what substances it is produced, and what tissues principally contribute to its formation?—we could not, in the present state of our knowledge, give any satisfactory answer to this question. All that we know is, that urea is a very general product of the decomposition of nitrogenous matter, both naturally within the animal body, and artificially in the laboratory of the chemist. We have already said enough to show, that urea is so common a product of the decomposition of nitrogenous bodies, that we could hardly any longer enumerate it among true organic substances, if we tried to establish a distinction between organic and inorganic matter. Moreover, when we treat of uric acid, we shall show, that, in all probability, a great part of the urea separated by the kidneys from the blood is the product of the decomposition of that acid.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 164.

69. *On the Quantity of Phosphoric Acid existing in healthy Urine.*—By Dr. D. Breed.—Notwithstanding the importance attached to every increase of our knowledge relating to physiology and pathology, an extended examination of the quantity of phosphoric acid in the urine has not been hitherto carried out by either a chemist or physician. A method, given by Professor Liebig, for determining phosphoric acid accurately and quickly, enabled the author to supply the deficiency, and to elicit some facts which may be of importance to the treatment of diseases.

This method consists in treating the urine with a solution of known strength of perchloride of iron until a small quantity of the mixture, when filtered and tested with ferrocyanide of potassium, gives a blue colour. It is based upon the fact, that a liquid containing phosphoric acid, both when neutral and when acidified with acetic acid, yields an insoluble precipitate with a solution containing peroxide of iron. The solution of perchloride of iron is best prepared by dissolving 15·556 grms. of iron in muriatic acid with the addition of nitric acid, evaporating to dryness in the water-bath to remove the excess of acid, and then dissolving the remaining salt in 2000 cub. centims. of water. One cub. centim. of this solution precipitates 10 milligrms. of phosphoric acid. Instead of this solution of perchloride of iron, one of indefinite concentration may also be used, the strength of which may be ascertained by testing with a solution of phosphate of soda, the quantity of phosphoric acid contained in which is known. The solution of perchloride of iron used must be perfectly free from the protochloride.

If the urine, the amount of phosphoric acid in which we are about to determine, has acquired an alkaline re-action from the decomposition of the urea, a portion of the phosphoric acid may have been precipitated in combination with lime or magnesia, and the precipitate must then be dissolved by the addition of a few drops of muriatic acid. The urine is measured and well shaken; a measured quantity, about 100 cub. centims. (or more) is drawn off with a pipette, and placed in a beaker, and acetate of soda (in considerable quantity of muriatic acid has been added) and acetic acid are added. The solution of the perchloride of iron is then cautiously added, and the mixture is frequently tested to ascertain if all the phosphoric acid is precipitated, until a trace of the iron solution has been added in excess. To detect the latter, a piece of filtering paper imbued with ferrocyanide of potassium is placed upon a white porcelain surface (or upon a glass plate with a piece of white paper lying beneath it), and a double piece of filtering paper pressed against it with a glass rod, from which a drop of the urine is hanging; if the urine contains an excess of the solution of iron, a blue colour is produced within from three to four seconds. The quantity of the solution of iron used is noticed. Two other portions are treated in exactly the same way; if the results agree, the quantity of solution of chloride of iron which would have been required for the entire quantity of urine is calculated, and the amount of phosphoric acid corresponding to this quantity of the solution of iron is contained in the urine, and is then ascertained. By this method, a physician who has but little spare time, can easily make several determinations of the phosphoric acid in urine every day.

The quantity of phosphoric acid in the urine of a man in health, and living a regular life, is nearly constant; but recent experiments have shown that the mode of living, as also diseases and medicines, cause a variation in the amount of phosphoric acid in the urine.—*Monthly Journal of Med. Science, October*, 1851, *p.* 368.

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70.—*Conditions of the Urine as Indicative of the State of Disease.*—[The following valuable remarks on the state of the urine are made by Dr. Dick, in considering the subject of dyspepsia.]

Urine which immediately on being voided gives out a sensible smell of ammonia, generally indicates that the vital powers have suffered declension; that disease has become chronic; that the patient is past middle life, or is prematurely aged, &c.

In arthritic and rheumatic cases, the mineral and vegetable acids are carefully to be shunned. Among the latter the oxalic is the most objectionable; next, the malic; then, the tartaric, citric, and acetic. There can be little doubt that these

acids act injuriously by their astringent effect on the cutaneous and mucous surfaces, by their thus interfering with their own elimination and that of the uric and lactic acids; thereby loading the blood with acidulous principles; whence follows that peculiar irritative condition of the nerves, constituting local affections, such as sciatica, lumbago, gout, or the systemic disturbance of rheumatic fever. It is amazing how difficult it is to rid the blood of this acidulous diathesis (if the expression may be used) when once it has been formed. The excernents seem to find it a peculiarly hard task to eliminate acids. Years of rigid attention to the dietetic ingesta are necessary. Hence the rarity of radical cures of gout and rheumatism.—*Lancet, August* 2, 1851, *p.* 103.

# SURGERY.

## DISEASES OF JOINTS, FRACTURES, &C.

### 71.—ON INTERNAL DERANGEMENT OF THE KNEE-JOINT.

By Samuel Smith, Esq., Senior Surgeon to the Leeds General Infirmary, &c.

[At the commencement of a clinical lecture upon this subject, this able surgeon draws attention more particularly to a peculiar affection of the knee-joint, because it is a condition which may be often overlooked. He remarks that it was in Leeds that the nature of the injury was first noticed, and the mode of cure described by the first William Hey, in his 'Practical Observations on Surgery.' Mr. Smith proceeds:]

In this accident, in consequence of some slight fall, slip, or sprain, the mechanism of the knee-joint became so far deranged, that the *full* extension of the limb is rendered impossible, either by the muscular efforts of the patient, or by the assistance of another person, unless the manœuvre I shall presently describe be first practised; the person walks with a limp, sometimes with much pain, and sometimes without; the great peculiarity of the gait is, that he walks with an imperfect extension of the leg; the knee remains constantly a little bent. In some instances the cure takes place suddenly and accidentally; in others it will continue for days, weeks, and months, and in such cases, I believe, sometimes lays the foundation for serious disease of the knee-joint. If we have an opportunity of examining the joint in a recent case of this injury, the eye will detect little alteration in its appearance, there will be no swelling or effusion, no pain when the limb is at rest; we ascertain that in our attempt to extend the limb, the ligament of the patella is not rendered tense, it is relaxed. This I believe to be in consequence of that singular consent of parts which is sometimes required; the powerful muscles inserted into the patella here refuse to act with vigour, in consequence of the pain which would be produced by such action to its full extent.

Mr. Hey says,—"An unequal tension of the lateral or cross ligaments of the joint, or some slight derangement of the semi-lunar cartilages, may possibly be sufficient to bring on this complaint." I am not aware that an opportunity has ever taken place where this matter could be set at rest by a dissection of the knee-joint in such a case. If the lateral or cross ligaments only were out of position, it is natural to suppose that the mere act of walking would at once replace them; my own suspicion is that the edge of the semi-lunar cartilage is turned upwards.

*Case.*—Henry Gray, of Calverley, nine years of age, came to the Infirmary, Jan. 30, 1850; six days previously, while running, he had been tripped up by another boy, and fell; he became lame. When he came to the Infirmary, his gait convinced me at once it was a case of internal derangement of the knee-joint; he walked without extending the leg properly, and in consequence of the misplacement having happened six days previously, there was some degree of effusion in the joint. I placed him upon the sofa, flexed and extended the leg, by which means he was somewhat better, but I did not feel satisfied that it was put quite right. His mother refused to allow him to remain an in-patient, and I refused to take the responsibility of the case, unless he was under my immediate inspection as such; she then consented, and he was sent to bed. When I saw him again, I repeated the manœuvre, with more success, for when I had obtained the full and complete flexion of the limb, I tied a towel round the ankle and upper part of the thigh, and desired him to lie on his side in this position until I had visited my other in-patients. In thirty or forty minutes I saw him again, suddenly extended the limb, and it was evident the joint was now in correct apposition, but the flexors were permanently contracted. This state of those muscles was corrected by placing the heel upon a doubled pillow, and a sand-bag above and below the knee. In a few hours he was perfectly well, and free from pain and lameness; there was still a little effusion, but that gradually disappeared, and he returned home well February 6th.

*From* my experience in such cases, I feel confident if this case had been treated

on the first or second day of the accident, the cure would have been immediate and perfect; but the six days had complicated it with effusion into the joint, and permanent contraction of the flexor muscles.

Now, with respect to the frequency of this accident: I have now been surgeon to the Infirmary above thirty-two years; I think I have been rarely a year without seeing a case, and I am sure I have seen as many as three or five cases in a year. I therefore conclude, that if in any large hospital in this country such cases are not seen and noted, they are overlooked, and I fear in many instances permanent lameness is the consequence.

On Friday evening last I was at a musical party, and at tea I sat next to a surgeon who was a member of a musical society. We had some conversation on this subject, and I mentioned this opinion to him; he coincided with me, and mentioned a case in point, with which case I was so much pleased, that I obtained his permission to make it known to you. Before I mention this case, I may remark, that an empiric, or a man quite ignorant of his profession, is never known to confess an error, but you will find the most enlightened, and those possessed with the most thorough knowledge of the profession, always ready to do it. Here is the case written down for me by Mr. Samuel Hey:—

"On July 3rd, 1847, I was called to attend Mr. Robert Swan, a respectable tradesman in this town, who had suffered a dislocation of the ankle; he was confined to bed six weeks, and afterwards used crutches for a length of time.

"At the beginning of December in the same year, as he was reaching something down from a shelf, he twisted the knee of the sound limb and became immediately lame.

"I saw him on the 6th of December, and found symptoms of inflammation of the synovial membrane, with effusion to a considerable amount. Antiphlogistics were then used, and on the 8th a large blister was applied, which, together with rest, reduced the swelling; still the lameness remained, the patient walking on the toe, with the knee bent, and with great difficulty.

"On the 16th, at least ten days after the accident, as I was leaving the house, I suddenly suspected that this might be one of the cases of derangement of the cartilages of the knee-joint described by my grandfather. I returned, made forced flexion several times, when the patient declared he was well, threw aside his stick, and walked about the room with perfect ease. On the 18th I applied a plaster and bandage, and took my leave."

There are some individuals, who after once having had this accident may be said to become liable to it. Mr. Hey mentions the case of a gentleman who suffered from it three times, and a lady twice. I have had a case of this kind in a young lady, which interested me much, and having recently seen her I requested her to put down in writing her own recollection of the circumstances, for I am sorry to say I have not committed one case of this kind to paper. Here is her letter.

"My dear Sir,—Since you wish for an account of the weakness of the knee-joint that I was subject to some time ago, I send you the particulars as far as I recollect. My knee was perfectly strong previous to the first accident I had, which was at the age of thirteen or fourteen. I was at the dancing-school, and having been reprimanded for not turning out my toes sufficiently, was told to stand at one end of the room with the toes violently turned out. I stood up, forced the heel forward and the toe back; still it was not according to the dancing-master's ideas of grace, who told me to turn the toes out still more, and in making the effort to do so, I felt something give way in the left knee, and I fell to the ground. I was assisted up and out of the room; after resting half an hour, the dancing lesson being over, I managed to limp home, which was at no great distance. I did not wish any one at home to know that I was lame, as I was going that afternoon to spend a week in the country, and I thought my visit might be prevented. The carriage was at the door when I got home, so I had no difficulty in concealing my lameness until I arrived at the end of my journey. There I remained a week, occasionally using my leg, but never able to walk without limping. The pain was not great unless I attempted to straighten the leg, in which I was unsuccessful. At the end of a week I returned home and you were sent for. You put my leg right during the first visit, by bending it backwards and suddenly forwards. I could then walk perfectly, but felt the joint weak and liable to fail.

I had a similar accident a few months afterwards, and, during the course of four or five years, I must have suffered from it at least six times, and on one occasion twice in the course of one day. On each occasion (excepting the first) you were at hand to give me relief. About seven years after the first time my knee went wrong, I had another accident with the same knee. I was staying with a friend in the country, and as we were undressing at night, my handkerchief being on the floor I took it up with my foot instead of my hand, and placed it on the pillow. This feat required the leg to be in an unnatural position, and I felt the knee give way at once. I fell across the door-way, and groaned in agony for a minute; on looking down at the leg, I saw some of the bones were displaced, and thought the best plan would be to try and straighten the leg, so I resolutely pushed it straight, though suffering much pain. Immediately the leg was straight, the bones seemed to regain their places with a snap, and the pain having gone as instantaneously, I concluded all was right. My friend assisted me into bed. The next morning you were sent for. I was obliged to keep the sofa for ten days, after that I wore a laced knee-cap by your recommendation, for some months, and now my leg is perfectly strong, and for a few years it has felt much stronger than it has ever done before, since the first time I injured it."

The only remark I will make on the above case is, that the last accident was a lateral dislocation of the patella.

I recollect another very striking case of this kind. One Friday afternoon, fifteen or twenty years ago, when seated at my table, examining the patients for admission into the Infirmary that week, my attention was suddenly directed to a middle-aged man walking into the room with a stick, and with that peculiar gait which at once said to me before a word was spoken, "internal derangement of the knee-joint." He had slipped and fallen ten days before; had had surgical advice without benefit for a week, when he obtained a recommendation to the Infirmary; he lived four miles off, and he said he had been four hours in walking that distance. Finding all the circumstances to agree with former cases of this kind, I placed him upon his side, performed the full flexion and sudden extension of the limb, and to my great gratification the limb was found to be quite right, and he walked well instantly. Well, I was proud of the case, and felt that I had another feather in my cap, and so, instead of sending him to the board-room as usual to be admitted a patient, I admitted him a patient, discharged him cured, and he returned thanks to the board for his cure, all within ten minutes. I, however, requested him to inform me in a week or two of the conclusion of the case: he came, and his words upon inquiry, as nearly as my recollection serves me, were—"Sir, I had not got one hundred yards from the infirmary before I threw away my stick, walked home as if nothing was the matter, and have been well ever since."

I have met with surgeons who have not believed in this statement of Mr. Hey, and they would explain the last case thus:—"Oh! there was a ligamentous adhesion in that case, and by your full flexion and extension of the joint, you broke it up, and thus effected a cure." I think, if such had been the case, the cure would not have been so perfect and so sudden. But how can those cases be explained where the derangement and the cure take place twice in the same individual within a few hours? Mr. Hey gives such a case, and my young lady, whose letter I have read, had it on one occasion twice on the same day. I usually manipulate the case in this manner, but as a plain description in words only without an example, is often soon forgotten, we will have Thomas the porter on table, and make a case of him,—you will thus have an opportunity of seeing the manner, as well as hearing the description,—it will then not easily be forgotten. If the right knee be the one affected, I place the patient at length on a sofa on his left side. I then take hold of the right ankle with my right hand, and by slow and gentle means gradually flex the limb till the heel presses upon the buttock; now is the time that a little cunning and art is required to perform the full extension, for if you attempt this without manœuvring properly, you are foiled, the muscles resist the action, and you can only succeed by cheating them.

I now take care that the patient does not see what I am about; I place the left hand above the knee, grasping the vasti muscles, hold the ankle above the heel with the right hand, make several gentle extensions, but no further than to a right *angle, and* when my patient seems fully impressed with the belief that I am going

to proceed no further, when I am satisfied I have caught him off his guard, I suddenly and powerfully perform the full extension of the limb. Generally I succeed, sometimes I fail, and have to repeat it once or twice. When the full extension is accomplished, the cure is usually complete."*

If the case be one of several days' standing, and there be any degree of inflammation or effusion in the joint (which may be told by the swelling), it is best to confine the patient to bed for a day or two after the reduction, for in such a case, without care, the displacement might take place again. I hope, from the simple statement that I have made, if one of these cases should come under your observation you will be able at once to detect and remedy it.

You will remember we were prevented succeeding immediately, in the case of Henry Gray, in consequence of the contracted state of the muscles at the posterior part of the thigh, which state was controlled by placing the heel upon a pillow, and a weight above and below the knee. This reminds me to make a few observations to you upon a subject which has had great interest with me, for you will find whatever disease or accidents a medical man has himself suffered from, that disease is ever afterwards one of great interest to him.

*On Permanent Involuntary Contraction of the Muscles.*—In the winter of 1810, whilst residing in the house of the late Sir Charles Bell, in Leicester-street, Leicester-square, I was suddenly awakened in the middle of the night by the sound of the watchman's rattle, and the cry of "Fire! Fire!" I took no notice until I ascertained that a crowd was collecting under my own window; then I arose, opened my window, which was to the front, and ascertained that within thirty yards, at the top of the street, and in full view, the Mexican Hotel was on fire; presently a lower window was thrown open, and a gentleman in nightcap and nightshirt leaped on the pavement. In a minute or two afterwards came from the same window clouds of smoke, and sheets of bright flame; then I noticed three women creeping on the roof, with nothing on but their night-dresses; these escaped into a neighbouring coachmaker's premises: soon afterwards every window was broken up by the heat; fire and smoke issued; there was no help, nothing could be saved, and, alas! several persons were burnt to death in their beds. Now, gentlemen, I have told you that old tale, because I think I picked up a little good surgery out of that fire, and here is my first case:—

It was a bitter cold, drizzling winter's night. I was so fascinated by what I saw, that I did not leave the window to put on even a stocking or a shoe. I remained full twenty minutes with my head out of the window, and my right forearm bent to a right angle resting on the window-sill. When I saw all was over, I retired to bed, cold and shivering. Before I proceed, I must tell you that at this time I was twenty years of age, and had a pet biceps muscle, which I was cultivating, and which (like many medical students of the present day whom I could name) I was very proud of. When I had been in bed some time, and wished to place myself in a proper posture for sleeping, I found the biceps muscle of my right arm was in a state of powerful involuntary and permanent contraction; the more I tried to overcome it, the more it mastered me. It was in open rebellion to my will, and a sturdy rebel it was with its two heads. I tried to coax it, and I found the soothing system answered best. I rubbed it, and gradually got it extended and easy; but when the limb was placed in a flexed position it suddenly got again into powerful contraction. After suffering a long time, I called up my esteemed friend, Mr. John Shaw, who was then my fellow-student; with his assistance I succeeded again in obtaining full extension of the arm, and was quite easy; but I suffered so much from its frequent return, that I was determined to prevent a relapse by lying with the whole weight of my body upon the arm when extended. I fell asleep in this position, and awoke in the morning perfectly well. It was many years before I had an opportunity of reaping advantage from the experience gained that night in the management of a case of permanent involuntary contraction of the

* Since this lecture has been delivered, I have been favoured with the following paragraph by Mr. S. Hey:—

"Where immediate success does not follow this plan, especially in cases of long standing, it has been recommended to flex the leg fully, placing the arm under the popliteal space as a fulcrum, to separate, as far as may be, the head of the tibia from the condyles of the femur, and at the same time produce rotation of the tibia. This has been successful."

muscles; but my next case was a very striking one, by reason of the very long-continued contraction and the suddenness of the cure.

Mary L——, a stout, robust woman, aged twenty-five, from Normanton (at that time a rural village, but now an important railway station,) was admitted a patient of the Infirmary, under my care, on the 30th of July, 1820. She had been fifteen months under treatment, suffering much, during the whole time, from permanent involuntary contraction of the four powerful muscles forming the quadriceps extensor femoris, the whole of which were in an extremely rigid state. She walked without pain, but an inability to bend the right knee in the least gave her the appearance of walking with a wooden leg; and during the whole of this time she had been unable to kneel. The warm bath, fomentations, frictions, and many other means, had been persevered in, for a great length of time, without producing the least effect upon her complaint. In reflecting upon this case, I persuaded myself that this state of the muscles had originally been produced from some such cause as my own case, and that it was now continued through force of habit. I also thought, if I could succeed in completely relaxing these muscles, and keep them in that state a few hours, the balance of power between these muscles and their antagonists, the flexors, might probably be restored; and thus a cure effected. I proceeded to try this plan the following morning. I placed her upon the bed on her left side, and taking hold of the ankle with my right hand, grasping the thigh with my left, in the course of about ten minutes I succeeded in drawing back the heel, and pressing it against the buttock, thus producing a perfect flection of the limb. This was not accomplished without considerable management, for the muscles made many attempts to overpower my efforts; but whatever degree of relaxation I obtained, I did not yield: but by gentle friction, and perseverance, my object was at last gained. It was gratifying to perceive that the rigid muscles became now perfectly relaxed. In order to destroy the tendency to reaction, two leather straps, with buckles, were placed, while the limb was in this condition, tight round the upper part of the thigh and ankle, thus fixing the limb in this position, with the heel touching the buttock. She remained, by my orders, bound in this manner, and lying upon her side, until my visit on the following day, upwards of twenty-four hours. The success of my practice was perfect. On being released, it was found the muscles, which had been for so long a period contracted, were quite relaxed; and not only so, but the tendency to involuntary contraction was entirely destroyed. She walked without limp, without pain, and with the perfect action of the hinge of the knee-joint during every step she took. Suspecting, however, it might return, she remained an in-patient ten days. No return of the complaint took place. She was made an out-patient and appeared as such.

Aug. 30th.—She was perfectly well, and had suffered no relapse. She brought with her a letter from her surgeon, requesting to be informed of the means which had been adopted for her cure, which I communicated to him.

Oct. 4, 1846.—I received a letter from the late Mr. Spink, requesting me to meet him in consultation, on a case at Tollstone, near Tadcaster. I found Master S——, a fine boy of seven years of age, had been twelve days confined to bed and the sofa, in consequence of a blow he had received on the body from a playfellow at school. Considerable pain took place, he was put to bed, and the usual remedies applied. When I saw him, he was lying on his left side, with the knees drawn towards the abdomen; he was in much pain, had been twelve days quite unable to put his foot to the ground, or alter the position of the foot, without acute pain; and it was suspected that there was some acute disease of the hip. After examination, finding some of the abdominal muscles and also those of the thigh in a painfully contracted state, I rubbed them, and, by gentle means, gradually brought down the thigh. I then gently pushed back the chest, and in five or ten minutes I ascertained that the painfully contracted muscles were relaxed and also at ease. I now took my patient in my arms, and placed him on the floor with the left leg foremost, ascertaining that in this position the muscles still remained relaxed, I left hold of him and confidently requested him to walk;—to the great surprise of his surgeon, and gratification of his father and mother, he walked well, and at ease, without limp or lameness. The cure was immediate and perfect, and no relapse took place.

I will not occupy your time by relating more of these cases; you will believe me when I say, I meet with them frequently, and many of you have had opportunities of seeing them in my practice. It is now more than twenty years ago since Dr. Williamson requested me to give him a short essay on some practical subject for the 'North of England Medical Journal;' I gave him this subject, it was published in the second number of that journal, and from thence inserted entire in 'The Lancet' and the 'Medical Gazette.'

Whatever muscles you find in this state, let it be your object to place their origin and insertion as far apart as possible; this secures a relaxed condition of them; maintain them in that state for some time, their opponents will then be gaining strength, and the balance of power will be restored. I often see the masseter in this state, and cure it by the gentle insertion of a wedge into the mouth. It is this state of the sternocleido-mastoideus which forms wry-neck, and I have several times succeeded in effecting a cure in recent cases by turning the chin to the opposite side, and keeping it there a few days by mechanical means. The muscles about the shoulder-joint often get into this state after accidents, and render the arm of very little use for months and sometimes for years. This state of the shoulder I have often cured by the same manœuvre formerly mentioned, placing the bend of the elbow on the crown of the head, with the fingers touching the ear on the opposite side, and keeping it in that position a few hours. The biceps sometimes remains for some weeks in this state after treatment for fracture of the forearm; the muscles of the fingers also, after injuries of the hand. The powerful extensor or flexor muscles of the thigh after long-continued, extended, or bent position of the limb in the treatment of fractures or other injuries, are left in this condition. The gastrocnemii and other muscles of the leg are often allowed to get into this state during the treatment of diseases or accidents of the foot or ankle, and often require more management and time to remedy after the cure, than the original disease.

More than thirty years ago I often suffered from a painful spasm of some small muscle under the angle of the jaw, which I believed to be the digastricus. On one occasion I accidentally ascertained that the pain was instantly relieved by opening the mouth wide, and keeping it thus a few moments. Some years afterwards I was consulted by Mrs. G—, who had often been affected in the same manner for many years. I mentioned my case to her, and advised her to try the same means. The plan answered for her, and by relieving the spasm at once, the tendency to its return was afterwards entirely prevented. Cramp in the leg from spasms of the gastrocnemii is instantly relieved by seizing the foot, and pressing its dorsum towards the front of the leg, thus bringing down the heel.

Whenever you meet with cases of this kind, remember those I have placed before you and the observations I have made; follow the same practice, and you will often have the same satisfactory result. I could give you many more examples; but the few I have brought before you have been sufficient to explain the practice to be followed in such cases. My object in giving this lecture will be fully gained, if, when you meet with these cases, you recollect what has here been stated, and do not overlook them. Remember, your medicines, your embrocations, your frictions, fomentations, and warm baths, will be of little avail; but place the origin and insertion of the contracted muscles as far apart as possible. They will then become relaxed; maintain them in this relaxed condition for a length of time, and the tendency to contract will cease. In the mean time, the antagonist muscles will gain strength, the balance of power will be restored, and the natural action of both sets of muscles will be obtained.—*Lancet, September* 20, 1851, *p.* 265.

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## 72.—ON HYSTERICAL AFFECTIONS OF THE HIP JOINT.

By William Coulson, Esq., Surgeon to St. Mary's Hospital, and to the Magdalen Hospital, &c.

[Mr. Coulson was consulted in the case of a young lady, nineteen years of age, highly nervous and excitable in temperament, with an affection of the hip joint. Leeches had been applied, the recumbent position enforced, and counter irritation in every available form employed—but all of no avail. The pain was diffused and

complained of as insupportable. The joint under examination seemed natural, and her general health had not suffered in proportion to the duration of the disease; indeed, there seemed as much pain excited if the integuments alone were examined. No persuasion could prevail upon her to make use of the limb. Steel and quinine were prescribed, but with no success. At length, by the death of her father, the means of living became much reduced, and the different members of the family were obliged to exert themselves to meet the calamity.]

This young lady upon being made acquainted with the particulars—for misfortune it was none to her—one day suddenly rose from her couch and walked. She exerted herself much, both mentally and bodily, for the good of those around her, seemed to forget her long illness, and has ever since remained well. That the joint was not affected with any organic change is clear from the result of the case. The disease was one of those obscure hysterical affections, more common among the rich than the poor, during which the impression of pain is in a morbidly excited and perverted state, and the power of the will over a certain group of muscles is suspended.

A limb was removed by a surgeon from a patient, whose symptoms, in many respects, corresponded with those in the case I have above related. The girl was in humble life, but well brought up, and was much noticed by some ladies who superintended the school where she was educated. She was of pale complexion, with dark hair and eyes, and of highly excitable temperament. Without apparent cause, severe pain came on in the right knee; the leg became flexed upon the thigh, and the slightest effort at extension excited impressions of intense suffering. She became an interesting object of pity; numerous professional opinions were asked by her patronesses, and frequent visits were paid to her by different surgeons. All, however, urged the necessity of her leaving her bed and using the limb; a measure to which she professed herself unequal. At the expiration of three years, during which her condition varied but slightly, a surgeon was induced, upon her representations, to recommend the amputation of the limb. To this she assented; the operation was performed, and the wound healed without any unfavourable symptom. Upon examination, the joint was found to be perfectly healthy. The synovial membrane retained its normal delicacy and transparency; the articular cartilage was slightly thinned, as is usually the case in a limb that has been long disused; the bones were light and easily sawn, but otherwise healthy; and there were no morbid changes in any of the surrounding structures.

It has been calculated, that at least four-fifths of the females among the higher classes of society supposed to be suffering from diseases of joints, are, in truth, affected with hysteria, and with nothing else. As, in the one case, absolute rest is requisite to effect a cure; and in the other, the patient must be urged, nay, even forced to take exercise, in spite of complaints of pain, it is important that the surgeon should be familiar with everything that will assist him to form an early and accurate diagnosis.

In hysterical affections of the hip joint, the patient from the first complains of pain in the part, and not in the knee, as is frequently the case when organic changes are commencing in the joint itself. The pain which the patient describes as most severe is not limited to one spot, but extends over the buttock to the lumbar region, and down the thigh. It is this general diffusion of pain which constitutes one of our most useful distinctions between this affection and disease of the hip joint. From the commencement, the patient complains of such aggravation of pain by pressure and motion, that she confines herself to one position of the limb; and yet upon occasions, when the mind is otherwise occupied, or during sleep, she will move it without complaint. The sensibility of the limb to the touch is frequently so great, that the slightest pressure on any part of the hip or thigh will cause the patient to scream; she shrinks involuntarily from the mere approach of the hand, but nevertheless, upon a careful examination, these morbid conditions will be found to exist more in the skin than in the deep-seated parts. As Sir Benjamin Brodie, who first directed attention to these important affections, observes: "If you pinch the skin, lifting it at the same time off the subjacent parts, the patient complains more than when you forcibly squeeze the head of the thigh bone into the socket of the acetabulum." The more the patient's attention is directed to the part, the more the pain is increased; but if her attention be

directed otherwise, she will hardly complain, and the pain does not interfere with her rest. In disease involving the structures of the joint, there is nothing of which the patient complains so much as the inability to sleep at night. Just as "Nature's soft nurse" comes to soothe the suffering and exhausted frame, a sudden start, or pain, or cramp, banishes sleep, and the patient dreads again to close her eyes. In hysterical affections, on the contrary, the sleep is calm and refreshing; and this, perhaps, is a great reason why the general health so slightly suffers, even in long-protracted cases. The pain is anomalous in its character, and different from the result of inflammation, or other organic changes. It may not be always easy to arrive at the truth, for such is the morbid constitution of the mind, that when leading questions have on a previous occasion been put, the patient will, as it were, take the hint, and symptoms, for which we previously may have in vain inquired into, will now actually present themselves.

A young lady, the subject of hysterical hip disease, came under my care, the case having previously been mistaken for disease of the joint and moxæ applied. The knee was bent; the limb inverted; the thigh rested upon its fellow, and the head of the bone was preternaturally prominent. A superficial observer might have easily mistaken it for dislocation. The most positive assurance on my part could scarcely remove the impression which existed in the minds of the parents that there was no organic disease in the joint, and that there was no necessity to pursue the plan of counter irritation and confinement. My patient was first directed to take out-door exercise in a carriage; with much trouble the limb was at length straightened; then she was persuaded to attempt to walk; and by these means she ultimately recovered.

Sir Charles Bell relates a case of this kind; and similar cases are not uncommon, in which "the knee was bent almost to a bursting of the ligaments, and the foot turned in so extraordinary a manner that the great toe lay close to the anus."

The age most liable to this affection is from fifteen to twenty; but when once developed, it may continue for a long period. I have met with cases in which the catamenia were irregular or scanty; but in other instances they have not deviated from health. The bowels are sometimes, but by no means invariably, constipated.

I will now sum up the symptoms by which this affection is distinguished from disease of the hip joint. In *the nervous affection*, pain is felt, from the commencement, in the hip, and extends to the loins and down the thigh; there is great general nervous excitability and extreme sensitiveness in the part; and the patient is from the first unable to walk. Combined with this extreme amount of expressed suffering, the trochanter major retains its proper bearing to the spine of the ileum. There is not the characteristic wasting of the glutei muscles, and consequently no flattened appearance of the nates. Pressure in these situations, when the bone approaches almost the surface, does not excite greater pain than in the other parts. There are none of those involuntary startings during sleep, which cause the patient such intense agony. On the contrary, however loud may be the complaints of the painful condition of the limb while the patient is awake, no sooner is she asleep, than she rests well and calmly throughout the night. In *true hip disease*, the reverse is the case; for, when nature is exhausted by suffering, and the patient faint from want of rest, the sleep, if unaided by the administration of opium, is broken by sudden cramps, shooting pains, and frightful dreams, or vague anticipations of coming pain.

There is one circumstance attending this affection of the joint, which is calculated to mislead the inexperienced practitioner. I allude to its being often described as consecutive to a blow or other injury. In fact, many surgeons believe that there is generally some such cause, which determines the manifestation of these nervous phenomena in any one particular joint. I cannot say that I share largely in this view. Were local injuries alone the exciting cause, the pain would be equally felt in such constitutions, in whatever joint were the seat of the accident; whereas, it is well known that, in by far the greater number of cases, the neuralgia is in the hip or knee.

[Dr. Conolly remarks that, in the nervous system of hysterical patients, there is an original susceptibility in excess, and that the natural constitution of the nervous system, and even different portions of it, is different in different indi-

viduals. With regard to the pathology of these affections, we know little. Is it in the brain or spinal cord? Are the pain and muscular contractions dependent upon the morbidly excited state of the spinal cord, the brain responding to these impressions? Or is it that the functions of the brain are all perverted? Mr. Coulson inclines to the latter opinion; though, no doubt, in many instances, there are undoubted proofs of a highly sensitive and excited condition of the cord.]

With regard to the treatment of this affection, it is obvious that, if it be mistaken for organic disease of the hip joint, the surgeon will be led to adopt a line of practice, not merely useless, but positively injurious. The seat of the disease being in the nervous centre, little can be done locally, with any benefit or relief to the patient. We are, therefore, called upon to direct our remedies to the state of the nervous system generally. The patient must be persuaded to leave her couch as soon as possible. It is useless to wait until the painful sensation has subsided. She must take carriage exercise daily, be in the open air as much as possible, and in the society of lively and cheerful companions of her own age. The diet should be plain and nutritious. In the common forms of hysteria, I find the vegetable tonics more efficacious than the metallic; but, in that now under consideration, they possess no superiority. Their employment, however, is by no means to be laid aside; for in all cases where the tongue is foul, and there are other evident signs of derangement of the digestive organs, they are more beneficial than any preparations of the metals. But under different circumstances, as when the appetite is tolerably good, the tongue clean, and the bowels regular, then it is that the metallic tonics may be tried with great effect. In most neuralgic affections, the preparations of iron prove successful, and among these the carbonate stands justly preeminent. It may be prescribed in as large a dose as the stomach will bear without inconvenience. Among the medicines that directly soothe the pain, none are preferable to valerian; for though much less powerful than opium and belladonna, it neither constipates the bowels, nor enfeebles the system.

"The medicine which I have found the most useful," says Dr. Copland, "is the spirits of turpentine, prescribed in various modes, internally and externally, and administered in enemata; the preparations of iodine, alone, or with narcotics and camphor. These, however, should be associated with suitable adjuvants; amongst which, the several narcotics and antispasmodics are the most important. The warm or vapour bath, simple or variously medicated; mental excitement, and exercise taken regularly and energetically, and employment of the mind, are also important aids in the treatment. The affections of the joints are sometimes accompanied, or even alternated, with severe nervous pains in the extremities, and occasionally with tenderness in some portion of the spine. In such cases the treatment hardly requires any material alteration. In those which have come under my care, I have very frequently prescribed the spirit of turpentine, as already stated, and often repeatedly in enemata; and after two or three doses of it, I have commenced with the preparations of iodine, conjoined with henbane, opium, or belladonna. Whilst the iodine has been given, the turpentine has been administered in enemata, from time to time; and embrocations or liniments assiduously employed."

When the pain has been extreme and almost insufferable, the local abstraction of blood by leeches has afforded relief; but it has been only temporary: and, as the effect of the loss of blood necessarily is to weaken the frame, their application cannot be often repeated without producing permanent mischief.

Counter-irritants, such as blisters, setons, stimulating liniments, mustard-poultices, and the like, all aggravate instead of relieving the pain. The belladonna or opium plaster, and sedative liniments, are the only local applications which I employ.

It may, however, be fairly questioned to what extent medical treatment in these cases is productive of good, unless there exists some evident derangement, against which our remedies may be directed. Far more is to be effected by moral treatment. Those absurd fancies to which young women of the present day are peculiarly susceptible, and which prevent their giving way to the vivacity and buoyancy of spirits suited to their age, should be carefully checked. The mind should be trained to regain its elasticity, instead of brooding over melancholy forebodings, or seeking to excite sympathy and compassion. The patient (cruel as it may

seem) should not be allowed the privileges of a sick-room; nor should she be permitted to recline upon the sofa during the day, an interesting object of solicitude to her friends, and of care to a medical attendant. By being compelled to move the limb, and enter into society, patients have been known to recover, after the complaint had resisted every other kind of treatment.

The time of cure varies. Sometimes it is instantaneous; at other times it is slow. The time, however, does arrive, when this morbid state of the nervous system passes away, and the patient begins, though somewhat late in the day, to feel grateful to those to whose judgment and perseverance she owes her recovery. Above all, let it be remembered, that in this affection, the power of motion is present from the beginning; but the will to exercise it lies dormant, until called into action by some sudden emergency, or excited by moral and remedial means.—*London Journal of Medicine, July*, 1851, *p.* 630.

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## 73.—CASE OF DISEASE OF THE ELBOW-JOINT.

By John Gay, Esq., Surgeon to the Royal Free Hospital.

Amputation of the whole limb, excision of the articulating surfaces, and the bringing about of anchylosis, are the three modes which have been hitherto resorted to, not to cure diseased joints, but to prevent the constitution from sinking under the drain of a disease but too often found incurable, and to render the portion saved in some degree useful to the individual.

Amputation, sweeping a remedy as it is, unfortunately but too often proves like the others inadequate to save the life of the patient; in many cases it hurries him to the grave, and shows only too forcibly how powerless our ordinary remedies are. Were it even of itself capable of always effecting a safe and complete cure, the mutilation it inflicts would ever prove a great obstacle to its employment. Excision of the articulating surfaces, which has saved many a limb that would otherwise have been amputated, has proved fatal in some cases, has succeeded but indifferently in others, and is tedious not only as regards the operation, but also the after treatment.

It is almost needless to say, that in a vast many instances all ordinary means of curing these diseases fail. Rest, splints, bandages, tonics, change of air and diet, mercurials, iodine, all fail to stay the progress of the disease, until it no longer becomes a question as to whether we shall have recourse to the knife or not, but how soon, and in what way, it is most advisable.

Mr. Gay has for some time past been in the habit of treating cases of diseased joints by a plan which has so far been found to be at one and the same time simple, rapid, and effectual. It is nothing more or less than to make one or more incisions right down to the diseased joint with a view of letting out the debris of the diseased articulation, the remnants of the cartilages, &c., which seem to him one of the principal obstacles to the procuring of anchylosis; a healthy inflammation is by these means set up in the cavity, which speedily results in firm and complete anchylosis. The constant success which has attended this plan seems calculated to bring about a complete revolution in the treatment of these complaints, and we hasten to lay before our readers details so full of interest.

J. T., a labourer, entered the Royal Free Hospital, under Mr. Gay, August 28th, 1851, with disease of the elbow joint. Of its origin and cause he knew nothing, and only remembers that it began about seven years ago, and since then it has run its course unchecked by any means. On admission, the state of the limb was as follows:—the arm was straightened and the elbow joint almost immovable, even the slightest attempt to procure motion being followed by excessive pain. The joint itself was very much enlarged, but the remaining part of the limb was wasted to a considerable extent. There were six sinuses leading to the joint, two on either side, one in front, and another on the inner side of the olecranon. Around their orifices the skin was livid and unhealthy-looking, and they all conducted direct to the joint, so that the probe passed immediately into it. A quantity of thin, ichorous fluid was constantly poured out from them. The man's health was much impaired, and although he had refused his assent to amputation,

which had been proposed to him while an inmate of another hospital, he was now willing to lose his limb, or, indeed, undergo any operation which seemed likely to free him from his constant sufferings.

On the 1st of July, although the state of the joint seemed to hold out scarcely the remotest hope of success, Mr. Gay made an incision on either side, carrying it along the course of the lateral sinuses, and fairly down to the joint. These incisions were each four inches long, and left behind great gaping wounds, laying open to view the interior of the joint. The ends of the bones were found completely bereft of cartilage, and so soft that portions were as readily torn away by means of a steel director as if they had been so much cork. But little bleeding followed the operation, which was concluded by filling up the cavities with lint, and confining the joint with a bandage. The first thing that ensued was a most profuse discharge, which continued unabated until about nine days after, when it gradually began to lessen, owing to the evident healing of the wounds, which now appeared strongly disposed to closeness. By the 29th, considerable progress had been made, but now the patient was, most unfortunately for himself, seized with simple fever. The wound rapidly assumed an unhealthy appearance; the joint was attacked with acute pains, and great quantities of thin dirty pus were poured out in place of the previous small amount of healthy secretion. The tongue grew furred, the skin dry and hot, while the pulse sank and quickened. His sufferings became very great, and in the course of twenty-four hours the sores had so increased, both in depth and extent, that the joint was almost laid bare. At this stage the patient most urgently entreated the removal of the arm, and Mr. Gay had almost decided, seeing the unfavourable turn matters were taking, on doing so as soon as the man's health should be somewhat recruited. But better things were in store for him. Active and judicious general treatment was resorted to; the patient's strength was carefully kept up by good diet, and the greatest attention. The secretions were vigourously watched over, and every effort strained to prevent him from sinking. On the fifth day a grain of opium with mercury and chalk was ordered three times a day, as there were no symptoms of local congestion; this relieved him greatly.

The joint was now constantly enveloped in poultices. On the ninth day the fever had left him, but in a very weakened state, and the wound began again to discharge healthy pus, and to show a tendency to granulate. He was ordered tonics, and an improved diet.

From this time the progress of the case was much more favourable and rapid than any one could have anticipated. The wounds began to close, and the discharge perceptibly lessened. Complete closure of the edges of the wounds was, however, studiously prevented by inserting pledgets of lint between them, and the joint was now as firmly bandaged as the patient could bear. By the 12th of September the wounds had completely closed, and anchylosis of the joint had taken place. An abscess, however, formed beneath the skin on the outer side of the joint; it was opened, and soon healed firmly up. Anchylosis took place, evidently enough at first by means of a soft, perhaps fibrous tissue, and hence some degree of motion was retained in the joint; latterly, however, this has ceased, and the uniting medium has apparently become ossified; at least its hardness and immobility would lead to such a conclusion.—*Med. Gazette, October* 3, 1851, *p.* 598.

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## 74.—ON THE VAGINAL, OR DEEP BURSÆ MUCOSÆ.

By William Coulson, Esq., Surgeon to St. Mary's Hospital, &c.

[Mr. Coulson explains his meaning of the term "deep bursæ mucosæ" to be the synovial membranes, usually vaginiform, interposed between two or more tendons, between tendon and bone, or between tendon and ligament, for the purpose of protection from the effects of friction, and for facilitating motion.]

In the upper extremity, where we have chiefly to deal with morbid conditions of these bursæ, the synovial membrane extends downwards as far as the distal insertion of the tendons, and upwards for some distance beyond the fibrous sheath. Each tendon is covered by a reflexion of this vascular membrane, and is loosely

attached in the whole, or in part, of its course, to the walls of the canal, by a fold similar to the mesentery, and called meso-tendon. These folds limit the movements of the tendons in a slight degree: they may be torn by some violent movement, and are occasionally the seat of disease.

*Anatomical Arrangement.* Upon the dorsal surface of the wrist, there are distinct sheaths,—1. For the extensor carpi ulnaris; 2. For the extensor minimi digiti; 3. For the extensor communis digitorum and the indicator; 4. For the extensor secundi internodii pollicis; 5. For the two radial extensors; and 6. For the extensores ossis metacarpi et primi internodii pollicis. Any one or more of these sheaths may become distended, and assume the character of a bursal swelling. There are also five or six thecal sheaths on the palmar surface, and these are the most frequent seat of enlargement. Enlargement of the bursæ in this situation is a most formidable disease.

The sheaths of the extensor ossis metacarpi, and of the extensor primi internodii pollicis, and of the extensor carpi radialis longior and brevior, merit special anatomical notice, as they are often affected with morbid changes. The two first, free in their fibrous sheaths, but covered by the same visceral layer of synovial membrane, can only be partially separated; and there are some anatomists who regard the two tendons as divisions of one and the same muscle. The two extensors of the radial side of the wrist are likewise retained in apposition by a common visceral layer of membrane, as far down as their point of separation to their respective insertions. The synovial membrane there leaves the extensor carpi radialis brevior, being continued only over the extensor longior. Throughout their whole course a meso-tendon attaches them to the posterior wall of the sheath.

Along the anterior or palmar surface of the wrist, and forearm, we have two sets of bursæ; some small, and often overlooked, others of considerable size. The palmaris longus and brevis are each enveloped in loose areolar tissue, abounding in thick serous secretion; and it is easy to comprehend how such a structure would become converted into a complete synovial sac under favourable circumstances. About three months ago, I removed from the hand of a working-man a thick walled cyst, lying between the integument and the palmar fascia, and containing a sort of synovia. It had doubtless been originally a bursa, thickened by the constant pressure of the hand upon the hard iron handle of an immense hammer. The patient described it as originally a small elastic swelling, situated under a part of the hand where the skin had for a long time been very much thickened; as the tumour increased in size, it pained the hand, and, interfering then with his work, made him anxious for its removal.

The tendon of the flexor carpi ulnaris has a large and well marked synovial sheath, especially loose and sac-like, near its insertion in the pisiform bone.

Finally, there are the general synovial bursæ, which invest the tendons of the flexor muscles of the fingers, and of which many different anatomical descriptions have been given. Fourcroy and Bichat affirm, that there is one synovial bursa at the level of the carpus. Velpeau and Cruveilhier describe two, one common to the flexor tendons of the fingers; the other proper to the long flexor of the thumb. Monro, Koch, and Bourgery, enumerate a much greater number of bursæ in the anterior region of the wrist.

Some of the deep bursæ communicate directly with the joints. The bursa beneath the crureus muscle belongs to this order, likewise the large bursa below the iliacus and psoas; its frequent communication with the hip-joint is well known. On the other hand, there are some which greatly resemble the cellular bursæ in various stages of transformation towards the perfectly developed bursæ. Of this kind is the extended bursal arrangement around the tendon of the plantaris muscle; another, equally remarkable, is between the middle tendon of the omohyoideus and the sterno-mastoid; and a third interposes between the long abductor and extensors of the thumb on the one hand, and the radial extensors on the other.

These structures resemble in many respects the serous membranes, and are yet more closely allied to the synovial, with which, as I have said, they are not uncommonly continuous. Upon their free surface we find a stratum of epithelium, supported by a basement membrane, and under this is a layer of blood-vessels, which may be filled with injection in a part rendered soft by partial decomposition. The blood-vessels form a net-work many layers thick. No one would suspect the

existence of such a number of arterial and venous capillary tubes, from the examination of this structure in its normal condition after death. In many situations are found vascular fringes, first noticed by Havers in the joints, and described by him as the source of secretion of the synovia. They are found along the theca of tendons, and in some of the bursæ in the neighbourhood of the knee, and are composed of loops of vessels. Although we may not be able to prove experimentally what tissue secretes, and what absorbs the oily fluid contained in these sacs, yet we may infer, that both processes go on most actively wherever the blood-vessels are most numerous. The vascular part of the bursa seems to cease where the membrane is firmly attached to a bone, as along the phalanges of the fingers.

*Symptoms and Pathology of Enlarged Vaginal Bursæ.*—In using the terms *superficial* and *deep*, I allude of course to the primary connexions of these structures, and in no way to the situations which they may subsequently acquire. A collection of fluid, either in the large theca of the flexor tendons of the forearm, or in a sac connected with this membrane, may make its way towards the surface so as to elevate the skin like the pointing of an abscess, and to render it thin and discoloured; and yet we must include this under the head of deep bursæ. The same remark may be applied to the bursa in the neighbourhood of the knee-joint, connected with the tendon of the semi-membranosus muscle, which frequently becomes enlarged and projects into the popliteal space.

The clear albuminous fluid, secreted in the healthy state by these structures, undergoes various modifications by inflammatory action. At first it becomes thinner and more sparing than natural, and the part when examined, communicates to the fingers a crackling sensation. Then it may be more abundant, and cause distension of the sac, attended by severe pain. If this affection be deeply seated, and beyond the reach of surgery, it gives rise to very considerable suffering, and excites symptoms which are not readily understood. If, for example, it occur in the bursa of the tendon of the psoas and iliacus muscles, it may readily be mistaken for incipient disease of the hip-joint. In course of time, the fluid of an inflamed bursal sac entirely loses its oily nature, becomes serous and watery, and is frequently of a yellow, or even reddish-brown hue, from admixture of blood.

But there are sometimes found, especially in the synovial theca of the flexor tendons of the wrist, numerous hard fibro-cartilaginous bodies, like millet seeds, floating loose in the distended sac. They have been improperly called hydatids, but are, in truth, growths from the vascular fringe of the membrane, projecting inwards towards the cavity, and covered by epithelium. As they increase in size, the pedicle connecting them with the membrane, is eventually broken by the friction of the parts contained within. We have instances of similar bodies becoming loose in the cavity of a synovial sac, in certain rheumatic affections of joints. The enlarged bursa is not uncommonly loculated, or divided into partitions by septa or bands. In general, however, the compartments readily communicate one with another.

The most frequent seat of enlargement is the synovial sheath, which invests the flexor muscles of the fingers, and extends from the forearm under the annular ligament to the palm of the hand. When distended by fluid, it produces a considerable elevation, which is often constricted and divided into two parts by the annular ligament of the wrist. The walls, when laid open, are found to be thicker than natural; the lining membrane is rough; the fluid contained within is opaque, yellow, or yellowish-brown, and thick, and it frequently contains those small bodies above-mentioned, which are smooth externally, and often hollow; some, however, are solid, of fibro-cartilaginous structure, and resemble grains of rice in general appearance. The cyst, when minutely examined, is generally found thickened and of fibrous structure; externally it is connected to the parts around by loose areolar tissue. Internally it presents a velvety or roughened appearance, and there proceed from it numerous fringes, of which some are pedunculated. Embedded in these fringes are sometimes those hard white bodies, which are frequently found free in the sac; some of them are elongated and seed-shaped, others flattened and triangular, or round. The smaller are generally solid; the larger contain a cavity. These bodies were described by Dupuytren as hydatids; and the term "hydatiform" has been applied to the bursal swellings about the wrist, under the idea that such parasites were the cause of the enlargement of the sac, and of the collection of fluid. Deviations, both in the quantity and in the consistence of the synovial

secretion, may produce a peculiar condition of these fibro-serous canals, which yield upon pressure a crepitating or crackling sensation. This sound may be heard in whatever region of the body fibro-serous grooves naturally exist. It is commonly heard in the region of the shoulder-joint, where it is connected with a morbid condition of the sheath of the long tendon of the biceps flexor cubiti. M. Poultain relates a case, in which these symptoms gave rise to the notion of fracture; and in 'The Lancet' for 1836, 1837, the late Mr. Wallace, of Dublin, mentions a case, where an affection of this kind, in the extensor tendons of the thumb of a young woman, had been mistaken for fracture. The same sound has been heard about the tendons of the hamstring, and behind the internal malleolus in the sheaths of the flexor muscles of the foot; behind the external malleolus, along the course of the tendons of the peronei muscles and those upon the instep, and in other parts.

Although violence is often assigned as the cause of this affection, its origin, in the greater number of cases, is obscure. It is more likely to depend upon the influence of some constantly acting source of irritation than on any sudden injury, and the symptoms which usher it in support this view. At times, indeed, there is at the commencement acute pain, which, however, gradually subsides when the part is at rest, and is excited only upon movement. But more commonly there is little or no pain felt by the patient, until he makes a greater effort than usual, when the attention is for the first time directed to the part. Upon awaking in the morning, the part is stiff, but the stiffness goes off after a little exercise. There is rarely either heat or redness; the latter is generally secondary, and referable to accidental rubbing and friction. There is always some amount of swelling, the form of which depends upon the natural connexions of the part affected. If the disease occur in the sheath of the extensores ossis metacarpi and primi internodii pollicis, the tumour extends obliquely across the lower part of the forearm, from the ulnar to the radial side. If it affects the radial extensors, the swelling, wider below than above, passes over the inferior and outer part of the broad extremity of the radius. Any anatomist can tell in what grooves this affection is situated, by making the patient move under his direction the different muscles of the forearm. In severe cases, the stiffness of the limb, the sensation of weakness, and the pain upon movement, are so considerable, that a man is unable to follow his employment; and, in the higher ranks of society, accomplishments, such as instrumental music, which require great freedom of movement, have to be suspended, or indeed, entirely given up.

The manner in which these tumours shew themselves, is as obscure as their etiology. Sometimes a peculiar creeping sensation is experienced down the fingers, wrist, and forearm; at other times there is stiffness, weakness, and difficulty of movement. In other cases, it is the tumour which first attracts the patient's attention; and the symptoms above related are felt only at intervals, and after any greater exertion than usual. The shape of the swelling, as it affects the large bursa mucosa surrounding the flexor tendons of the fingers, is variable; sometimes it commences in the palm of the hand, at other times in the lower part of the forearm; and in both instances it soon becomes bound down by the annular ligament. Indolent, and painless upon pressure; fluctuating, and presenting irregular projections, it appears as a bilobed mass, upon which the fingers have an involuntary tendency to close. If the contents be steadily and forcibly squeezed downwards towards the hand, a movement may be communicated to the fingers, along whose thecæ the fluid is pushed. And, during this examination, when the fluid is pressed backwards and forwards from one end to the other of the enlarged sac, a peculiar *frottement* is felt, upon which Dupuytren laid great stress as a diagnostic symptom.

The pain and sensation of weakness produced by such a tumour is so great, that the limb soon becomes useless; the fingers are permanently bent, and any attempt to extend them excites a dragging sensation along the entire cyst.

Cases occur, when the tumour is large, in which the ulnar artery and the superficial palmar arch are raised upon the swelling; the radial artery, too, may be separated from the bone, before it turns under the styloid process of the radius. The integument of the palm of the hand becomes thin from want of use, loses its transverse markings and lines; it is elevated into a soft, smooth, compressible swelling, extending, in severer cases, along the flexor surface of the fingers. Continued position of the fingers in this abnormal state, leads to permanent changes in their articulating surfaces, and in the ligaments which unite the bones one to

another; hence it arises that in old cases, where the flexion has existed for a considerable time, the evacuation of the cyst, or the cure of the bursal enlargement, does not restore the mobility of the fingers.

*Diagnosis* of these tumours is not at all times so easy as many surgeons have affirmed. If situated on the palmar surface of the wrist, the bursa is recognised as a fluctuating bilobed mass, the shape depending upon the size of the sac, and the constriction of the annular ligament. But the contents may be of such consistence, that there will be no fluctuation. But the crepitation to which I have before alluded, produced by the passage of the fluid containing the hard grain-like bodies from one compartment to another of a sac, through a narrow orifice, may be taken as characteristic of the nature of the tumour, in connexion with the constriction produced by the annular ligament.

M. Robert, however, has recorded the following case of fatty tumour of the hand, resembling, in many of its physical signs, the affection which we are now describing. 'Annales de Therapeutique, tome ii."

A young man, aged 27, a butcher, was admitted into the hospital, with a tumour of the size of half an orange, situated upon the ulnar side of the palm of the right hand. It was subcutaneous, soft, and elastic, giving a peculiar crackling sensation upon pressure, and lying in front of the flexor tendons: it was trilobed, and deeply grooved. The fingers were slightly flexed upon it. The patient had noticed it first when about twelve years of age. It remained stationary till three years ago, when it suddenly increased in size. After an exploratory puncture, a crucial incision was made, and the skin was reflected back, when a tumour was exposed, composed of two portions set one within the other; the inferior flat, but deeply hollowed in the middle; the other portion of a cylindrical form, lodged in the hollow of the preceding. The second portion was moveable upon the first; and the friction thus produced, communicated to the hand the "crepitating sensation" above referred to.

An important part of diagnosis rendered more valuable by accurate modern research, is derived from the consideration of the natural connexions of the bursal sac affected by disease. The origin of the tumor, its inclination rather towards the ulnar than the radial side, the effect produced upon the fingers, the free movements of the thumb,—these are points which indicate that the disease originates in the bursa of the general flexor tendons. The circumscribed swelling of the radial side of the hand, the weak condition of the thumb, the inability on the part of the patient to bring it into firm apposition with the rest of the hand, pronounce the bursal affections to be limited to the tendon of the flexor longus pollicis.

*Prognosis.*—Many years may elapse before these tumours acquire any great magnitude. Slow in their growth; often painless; obscure in their origin; they pass unheeded, especially among those whose occupations require neither the exercise of great strength, nor the application of great delicacy of touch. Ultimately, after years of enlargement, they become stationary, but they do not disappear; at least, there is no satisfactory case of the kind upon record. All, then, that we can expect nature to effect, after the establishment of the disease, is the arrest of the further enlargement of the tumour.

As regards the serious nature of these affections, those tumours confined to a single finger, often limited in extent, are less to be feared than those in the palm of the hand, involving the entire bursa, and requiring the performance of an operation, which, though simple as regards execution, may be followed by dangerous symptoms.

*Treatment.*—It is customary, in the chronic cases, to employ counter-irritants, such as blisters, irritating ointments, &c. The emplastrum ammoniaci cum hydrargyro, spread upon leather, may be applied to the limb, and secured by a firm bandage; the whole to be worn for several weeks. If the fingers are stiff, friction of the limb and passive motion may be resorted to, when the swelling has in great measure disappeared, and the fluid is nearly absorbed. The arm may be soaked and rubbed in a warm arm-bath daily. When the limb is immersed in a heated fluid, much greater force may be used with impunity, than under the ordinary circumstances.

The operations which have been recommended for the cure of these synovial tumours are the following:—Extirpation; incision, either simple or combined

with irritation of the surface of the cyst; subcutaneous puncture; and iodine injections.

As regards extirpation, it is extremely difficult, on account of the extent of the connexions of the sac.

I have generally contented myself with making an incision longitudinally through the most prominent part of the swelling, and evacuating the contents. Some amount of inflammation usually supervenes; and the cavity becomes obliterated in the usual manner. But there is a risk of the inflammation proving very severe, and extending along the muscles of the forearm, attended with a high degree of fever and constitutional disturbance. Death has ensued from such an attack; and in other cases, in which the inflammation has been subdued by active treatment, the mobility of the fingers has been permanently impaired.

The use of the seton may lead to results difficult of management, and even dangerous to life. The following case, recorded in the 'Leçons Orales' of Dupuytren, shows how a fatal result may follow its employment.

*Case.* A carpenter, aged 35, received (Dec. 1812) a sprain in the right wrist, which healed in a short time without trouble. About two or three months afterwards, he remarked a small tumour in the palm of the hand below the annular ligament, and soon afterwards a second above the ligament: they were at first very small, and but little troublesome. They impeded at first the free exercise of the hand, and afterwards prevented its motion altogether. Being unable to continue at his trade, he consulted M. Dupuytren, June 7th, 1814. From its position, the nature of the tumour was suspected; and examination rendered the point clear. The following day, an incision was made into both tumours, and a multitude of little white bodies immediately escaped. The aponeuroses of the hand and of the forearm were liberated by means of a blunt-pointed bistoury, that there might be no constriction in the event of inflammation. A seton was introduced to inflame the walls of the cyst; and a poultice was then applied to moderate any inflammation that might arise. Severe pain supervened on the evening of the operation. It increased, accompanied with great swelling, on the second, third, and fourth days; a greyish fluid, mixed with flakes of lymph, flowed from the wound. The seton was removed the fifth day. The inflammation extended to the arm, and to the axilla; and constitutional symptoms of the most distressing kind arose on the eighth day: some gangrenous aponeurotic structures were divided. An abscess, which had formed between the first and second metacarpal bones, was opened. Compression expelled a quantity of pus, which had formed sinuses the whole length of the forearm and hand. On the tenth and eleventh days, there were shiverings, with convulsive action of the jaws, lasting about ten minutes. The pus was extremely fetid. There was general weakness, which resisted the most powerful tonics; and death ensued on the fifteenth day from the operation.

This case made a deep impression on Dupuytren, who for the future changed his mode of operation. In place of a simple opening in the most prominent part of the tumour, he made large incisions; and substituted for the seton a piece of lint interposed between the edges of the wound, to prevent their union. Mr. Syme, of Edinburgh, impressed with the same fear of constriction in these cases, has recommended the preliminary division of the annular ligament, as was suggested a long time ago by Warner. Mr. Syme has published a successful case in the 'Edinburgh Monthly Journal' for October, 1844.

Professor Gerdy has successfully practised the subcutaneous incision; and such an operation has much to recommend it, as there is not that fear of the severe inflammation which often attends the exposure of the cyst. The operation should be combined with pressure; still, though less dangerous, it is also less sure than incision, and there are many cases in which it is impracticable.

Iodine injections have been recommended by Velpeau in the treatment of these bursal enlargements, but many objections have been raised against the practice, on account of the chance of severe inflammatory disturbance. I am inclined, however, to recommend this plan for adoption.

M. Chassaignac has related a case in the 'Gazette des Hopitaux,' in which, after having evacuated the fluid, he injected through a canula, first some warm water to clean out the cyst, and next some tincture of iodine. The cyst was then

emptied, moderate pressure upon the walls was exerted by means of a compress, and the opening made by the trocar was properly secured. Some inflammation supervened; but it yielded to treatment, and the case terminated favourably.

An analysis of the cases in which this treatment has been tried is decidedly favourable to the practice, although I am not quite prepared to agree with Michon, that there is less chance of inflammation than of relapse and re-collection of the fluid. An attack of inflammation of the hand is always a serious matter, often so impairing its movements, as no subsequent endeavours on the part either of the patient or of the surgeon may be able to rectify.

Professor Bouley has demonstrated the superiority of iodine injections over other means of exciting inflammation, and he has succeeded thus in dispersing tumours of large size, without danger or inconvenience. If therefore simple puncture or incision should fail in the first instance, I recommend this practice as far preferable to the introduction of setons and other foreign bodies.

It must not be supposed that the surgeon has effected all his task by the evacuation of the fluid and the obliteration of the cyst. There remains for him to restore the mobility of the fingers, long since become stiff, semi-flexed, and in great part useless. For this purpose he must recommend exercise, passive motion, baths, &c., and by perseverance the hand may again be brought into a useful state.

It is singular that this affection of the bursa of the flexor muscles of the forearm and hand should be rare in the corresponding structure in the lower extremity, more especially considering how the foot is compressed in tight boots, and exposed to constant violence and injury. A case, however, of the kind is related in the 'Medical Times' July 13, 1850. A young lady, aged 20, of slight frame, but in the enjoyment of very good health, consulted Mr. Stanley for a painful swelling of the right foot and ankle. Five years previously, she had been greatly fatigued by a walk of extreme length, and she arrived home much exhausted, but was sufficiently recovered in a few days to go about as usual. From that time, however, the right foot and ankle were weak and painful, and swelled upon her taking the least exertion. About two years ago the swelling became permanent, and the ankle, which was easy when at rest, was so painful when she attempted to walk, that she was obliged permanently to keep the horizontal posture. Every variety of treatment had been adopted without avail; the swelling about the joint increased until the integuments gave way, and there formed an ulcer, whence flowed a thin sero-purulent fluid. There was a large swelling between the tendo Achillis and the os calcis, extending down to the sole of the foot; part of the swelling was firm, part was elastic, as if containing fluid; the integuments covering it were thinned and livid, and had given way in one spot, exposing a fungous-looking mass of granulations; the movement in the joint was perfect. The limb was removed, and the morbid change was found to be limited to the synovial thecæ, which surround and accompany the tendons of the tibialis posticus, and the flexor communis digitorum muscles to the sole of the foot. It was, therefore, strictly circumscribed and surrounded by healthy structures. The thecæ were thickened: their usual bright synovial surface was converted into a dull, uneven, velvety structure, from which was produced a soft growth composed of cytoblasts, and a small quantity of delicate fibrous tissue. This growth made its way upwards between the posterior surface of the tibia and the tendo Achillis, and downwards into the sole of the foot, between the flexor brevis digitorum and the flexor accessorius muscles, both of which were quite healthy. The flexor tendons were unaltered in structure, but were surrounded by the soft growths above described, and by a large quantity of morbid synovial secretion, which seemed to be contained in more cavities than one; for behind the malleoli it was of pale straw color, and somewhat stringy, whilst in the sole of the foot it was of watery consistence, of red colour, from admixture of blood, and contained coagula.

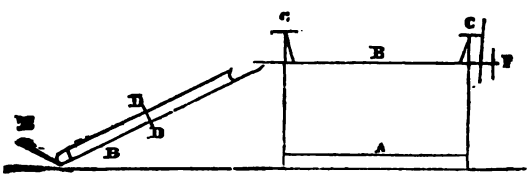
I cannot conclude this paper without strongly recommending those who desire further information on the subject to consult the thesis of M. Michon, to which I am indebted for many of the preceding details.—*London Journal of Medicine, Oct.* 1851, *p.* 881.

## 75.—THE SLING FRACTURE-BED.

By T. M. Greenhow, Esq., Senior Surgeon to the Newcastle-on-Tyne Infirmary.

[Mr. Greenhow draws attention to his new invention on account of the advantages he believes it to afford in the treatment of fractures of the femur, especially in the upper third, and in compound fractures of the leg, wherein it secures reduction and maintains a permanent position of ease, undisturbed by the most elaborate dressing. He says,]

A careful inspection of the instrument will render its application easily understood, but the slight diagram I enclose may serve to illustrate its leading features.




The stand A rests upon the bed; the splint B is supported by slings from four uprights at C C, and may be raised or lowered at pleasure by the screws at top. The thigh-splint rests on the bed at the ischium, and both behind and at the side can be lengthened or shortened to suit the length of the femur, by acting on screws at D D. A groin and a waist belt, passed through the strong loop E, fix the pelvis to the splint, giving ease and security to the patient, who is enabled, within certain limits, to move the pelvis, so as to relieve the irksomeness of an unvarying position, and for other necessary purposes. The extension of the leg is effected by acting on the screw at F, by which the foot-piece is drawn down gradually, but powerfully, and with the greatest degree of precision. The calf of the leg rests upon a moveable piece of India-rubber cloth, or cross strips of bandage, capable of being most easily removed and replaced, when dressing and cleansing are required; and the outside thigh-splint and loop E can easily be adjusted for either limb. Of course the injured extremity requires to be protected by pillows suitably arranged on the fracture-bed.—*Lancet, September* 20, 1851, *p.* 276.

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76.—*On a New Apparatus for Fractured Clavicle.*—By Henry Lee, Esq. Assistant Surgeon to King's College Hospital, and Surgeon to the Lock Hospital. [When the clavicle is broken, the shoulder falls in by the action of gravitation, being drawn by the action of the muscles into contact with the ribs. To remedy this, the most common method employed is the figure of 8 bandage applied across the shoulders. This keeps the two scapulæ on the back of the chest, and prevents their anterior edges from falling forwards. The next is that of M. Desault, consisting of a wedge-shaped cushion placed on the axilla with the thick part upwards. A third plan is the recent one of Mr. Ellis's, consisting in the adaptation of a firm cushion in the shape of the top of a crutch to the axilla of the affected side. But in this, as in the method of M. Desault, the cushion which forms the fulcrum is constantly liable to move with the motions of the ribs. Mr. Lee says:]

Messrs. Philp and Whicker, of 67, St. James' Street, have, at my request, constructed an apparatus, by means of which lateral extension can be made in cases of fractured clavicle from a fixed point. It consists of a backboard, retained in its position by two broad straps crossing over the shoulders, and by a perpendicular plate reaching to the loins, and connected with a band round the waist: a firm cushion is adapted to each axilla, and extends to the front of the shoulder-joint. To the anterior extremities of these, the straps which go over the shoulders are buckled. Each cushion is directly connected with the backboard by means of a steel bar, slightly concave forward, and capable of being extended laterally and fixed in position by means of a screw. When applied, the two cushions are separated to a convenient distance and fitted to the axillæ. The straps are drawn

moderately tight over the shoulders, and the elbow of the affected side is connected with the body by means of a handkerchief or bandage. It is advisable also to support the arm in a sling; and this may be conveniently done by passing a broad band from the elbow in front and behind the arm to the opposite shoulder, below which the cushion in the axilla affords a fixed point for its attachment.

The principal advantage of this apparatus consists in its different parts being so connected and adjusted as not to move with the motion of the ribs; for as these are raised, in all their ordinary actions, simultaneously on both sides, any influence which they possess must be exercised equally in different directions; and as corresponding parts of the apparatus are placed upon the two sides of the chest, any tendency to displacement is exactly met and counteracted by a similar tendency from the opposite side. The result is, that although the cushions rest upon the ribs, they yet do not move with the ribs, but afford firm, and comparatively fixed, points of support.

A second advantage of this apparatus consists in its not requiring to be readjusted; should the bandage round the body or the sling which supports the arm become loose, they may be tightened without in any way disturbing the position of the instrument, or the fracture.

A third point of some importance is, that the arm on the opposite side to the fracture is not confined, and the patient may, in ordinary cases, be allowed to walk about as soon as the instrument is properly adjusted.

In severe fractures of the clavicle, and in such as are complicated with injury to the ribs, it may become desirable to remove all pressure from the side of the chest. This may readily be accomplished by increasing the distance between the two cushions, and connecting *both* the arms with the body. Any amount of lateral extension may in this way be made without any pressure upon the ribs, and even without interfering in any degree with their actions.—*London Journal of Medicine, September*, 1851, *p.* 799.

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## AMPUTATIONS.

### 77.—SOME OBSERVATIONS ON EXCISION OF THE PELVIC EXTREMITY OF THE FEMUR.

By Dr. R. Knox, F.R.S.E., Lecturer on Anatomy, &c.

[Dr. Knox makes the following observations as the results of a long professional life. As two of the most distinguished surgeons are antagonistic in their views on this subject, Dr. Knox states his obligation to Mr. Walton, who has published a list of all the operations which have been performed up to the present day. According to some surgeons, excision of the head of the femur is an operation quite unjustifiable under nearly all circumstances. That an extreme opinion condemnatory of the operation in all or even in most cases is wholly erroneous, or, at least, a hasty and ill-founded opinion, based on no extensive pathological research, may be proved by the following cases collected by Mr. Walton.]

*Case* 1.—Eliza Wingen, aged 10. There had existed morbus coxarius, terminating in dislocation of the head of the femur. Excision of the head and neck of the femur was practised by Mr. Fergusson. The head of the femur was found to be much reduced in size, and was carious. Scarcely a trace remained of the acetabulum; it seemed to have been filled up with new bone. The patient recovered. (See 'Medical Times,' April 7, 1849.)

I abstain from making any remarks on the details of this case, it being put forward here merely to show the untenable character of the extreme opinions advanced by a portion of the medical press in respect of such an operation as the one I have just quoted.

It has been stated by an excellent surgeon (Mr. Lloyd), and his opinion has been echoed by others, that the surgeon ought to wait and delay operating in cases of hip disease until the constitutional disease has ceased. Now, what proof is there in the history of the above case that the constitutional disease had ceased? Is it usual for scrofula to desist from its ravages at ten years of age? and if, by an unusual combination of fortunate circumstances, the constitutional affection

had really ceased in the case of Eliza Wingen, by what symptom was it known to have done so? Is it usual for surgeons to wait for the cessation of the scrofulous diathesis in white swelling of the knee-joint, or in any other disease, when death is imminent, before they consent to operate?

In respect of the condition of the acetabulum in the above case, the question is too important to be discussed in a cursory manner, when merely alluding to it as a successful case after operation. There is no proof that the acetabulum had ever been diseased; and I question the supposed deposition of bone presumed to have filled up the cavity. In very young persons—and the patient was only ten years of age—it is just possible that pelvic disease existed and had ceased prior to the operation, and that the cotyloid cavity had been filled up by a deposition of new bone. But this view of the case I am not disposed to take. It is far more probable that no pelvic caries had ever existed, or, if so, only to a small extent; and that the seeming filling up of the cotyloid cavity was due to a very different process. In the adult, whether in man or animals, after unreduced dislocation of the femur, the cotyloid cavity disappears, not by a process of filling up, but by absorption and consequent levelling of the elevated borders of that cavity. The joint being no longer used—no longer required, in fact, the acetabulum being no longer filled by its appropriate bone, the articular apparatus disappears; the synovial membrane and arthroidal cartilages break up by disintegration; the fibro-cartilaginous rim or border equally gives way, and the deep margins of the acetabulum become absorbed. It is this levelling process which makes the cavity look as if it had been filled up by new bone. The same happens to the glenoid cavity of the scapula in unreduced dislocations of the shoulder; and the total disappearance of the alveolar cavity by absorption and not by filling up, when a tooth has been extracted, is a strictly analogous process. Admitting then, the possibility of a filling up of an articular cavity by new bone under such circumstances, in very young persons, such occurrences in the adult must be exceedingly rare.

That pelvic caries must be a frequent concomitant of caries in the femur, the pathology of scrofulous disease warrants us to assume. It constitutes, in fact, the main difficulty in all such cases. Nevertheless, it must be kept in mind that the femur is a movable bone, and the pelvis is a fixed one,—an important consideration in respect of an operation by which it is proposed to remove the moveable bone or fragment, leaving the fixed one to its chance of recovery when no longer exposed to contact with the diseased moveable one. It gives the pelvic bone an additional chance of recovery. At all events, matters cannot be worse than before the operation.

On the other hand, it does sometimes appear, that at a certain stage of the morbus coxarius, when dislocation has taken place, that is, when the opposing diseased surfaces are no longer in contact, the pelvic portion seems to recover. But, be this as it may, it is certain that in the caries of adults, when attacking these bones, the head of the femur may be the sole part affected; or the caries may be confined exclusively, as I shall afterwards show, to the upper surface of the great trochanter, and may easily be covered with the point of the finger. Now, as adult caries is quite incurable by any means short of the actual cautery or excision, it is not surely meant by any one to leave such cases to themselves.

During the last twenty-five, or it may be thirty years, the attention of surgeons has been directed to the propriety of extracting, through an external excision made for this purpose, so much of the head and neck of the femur as seemed by its presence to maintain, by its carious or diseased state, incurable sinuses, purulent and exhausting discharges, and a condition of the joint irremediable by any other treatment.

In making this *seemingly* bold attempt for the speedy cure of a hitherto intractable disease, surgeons were, no doubt, quite aware, or at least ought to have known, that the caries affecting the femur was most usually a morbid affection, not confined to this bone, but was a disease affecting simultaneously, in many cases, the pelvic bones entering into the composition of the joint; that the os innominatum in fact was quite as liable to constitutional or scrofulous caries as the femur itself; that both are, unhappily, most frequently simultaneously affected, and that the removal of the femoral portion of the disease (the pelvic part being beyond the reach of excision at least, if not of any surgical treatment) by no

means warranted the inference, that disease in the pelvic portion would in all cases be arrested, and a speedy and safe cure be effected. But practical men were also aware, that the simultaneity of femoral and pelvic caries was not uniform; that a period arrived, sooner or later, in the progress of the disease, when surgical measures seemed indicated; and that an improved operative surgery, based on a more exact anatomy, and a sounder physiology, due chiefly to Mr. Hunter, enabled modern surgeons to attempt and execute operations with success, which in former times were never thought of.

While opinions were in this conflicting state, clearly from a deficiency of facts or materials which alone could decide important questions like these, it was natural for the operative surgeon to say, "in youth constitutional disease of the joints is frequent; such diseases, when left to themselves, but too often terminate in destruction of the limb, or death of the patient. But experience has shown, that when scrofulous caries attacks the extremities of the bones forming the elbow-joint, the removal of the diseased portions of these bones is a comparatively safe and effectual operation, leading to the most beneficial results." From the elbow-joint, on which so many successful operations have been performed, an application of these views was readily made to the ankle, wrist, and other joints, remote from the trunk. The knee-joint followed as a matter of course; lastly, the shoulder and hip-joint itself. That objections should be made to rash operations on these large and important joints was naturally to be expected and approved of by the cautious; but we shall find that the objections in the main lay against rash operations merely, and not against those undertaken for the preservation of life or limb.

As the chief object of this memoir is to consider the question of removal of a portion, larger or smaller, of the pelvic extremity of the femur in cases of scrofulous, or as it is sometimes called, constitutional caries, I shall first consider this point alone; in a shorter section, I shall venture a few remarks on the excision of portions of the same extremity of the femur, in cases which, whether affecting merely the trochanters, or implicating the joint itself, cannot be so readily included under the same category. I allude, in a word, to caries of the trochanters, neck, and head of the bone, occurring in the adult, at a period when it is presumed the constitutional tendency to scrofulous disease may or must have ceased.

I pretend not to offer any opinion of my own in a dogmatic way; the truth is, that no facts or materials have been collected to enable any surgeon to do so, whatever may be his standing in the profession. "At what stage of the disease of the hip-joint may the operation of removing the head of the femur be performed?" By "head of the femur," I do not mean exclusively the part called the head. Scrofulous caries of the pelvic extremity of the femur is not confined to the head; the pathological condition in question extends, unhappily, but too often to the neck and trochanters. Of the co-existing pelvic disease I shall speak presently. In hip-disease, then, it may be found necessary to remove by operation, not merely the head of the femur, but the adjoining portion of bone, the neck, in brief, and the trochanters.

The question I propose here for solution is more complex than will at first appear. It involves two others at least, which it is not my intention to discuss at any great length in this memoir. The first is, in what number of cases of hip-disease, whether the disease be the true morbus coxarius, the scrofulous caries of the bones forming the joint, or the more obscure affection attacking the adult, is pelvic and femoral caries simultaneous? Secondly, how is this simultaneity to be detected? And, thirdly, (for this question also merits the deepest attention from the surgeon,) does the co-existence of pelvic and femoral caries forbid all attempts at operation?

To answer all or some at least of these questions, regard must be had, first, to the local malady, and secondly, to the system at large. I shall endeavour in the course of the following observations not to lose sight of any of these questions, although it is not my intention to discuss them systematically.

1st. Without pretending to establish any rigorous line of demarcation between caries attacking the adult bone and the constitutional form of disease, known by the name of morbus coxarius, it is nevertheless certain, that when caries attacks the adult it is usually an intractable and incurable disease otherwise than by sur-

gical means, and these must be of a bold character. No constitutional treatment will answer, because we do not know in what the constitution is at fault. When this form of disease attacks the adult bone, it may and does persist and continue until death closes the scene, thus enabling the surgeon to ascertain, by post mortem examination, that the diseased or carious portion of bone could be covered with the extremity of the finger. The head of a trephine or a red-hot iron applied to the part during life would have saved the patient. That such an occurrence as this might happen even in scrofulous caries I do not doubt, although generally the caries is in such cases much more extensive.

Mr. Walton met with a case of caries of a small portion of the neck of the femur, which had persisted for seventeen years, and at last destroyed the patient. Mr. Syme, in the 'Edinburgh Medical Journal, Vol. XXXVI.,' speaks of a thigh-bone in his possession which he had taken from the body of a woman who had laboured under caries of the trochanter major of the femur for thirteen years; and the following observations bearing on this point occurred to myself very early in my professional career.

In 1816, I had charge, with others, of the detachment hospital then existing at Melsea, in Hampshire. It was an hospital which had been established there to relieve the adjoining garrisons of Portsmouth, Portsea, and Gosport, by receiving invalids coming from abroad; for the reception, also, of acute cases of disease from the regiments in garrison, whenever the regimental hospitals became crowded with sick. Among the patients and invalids thus received in Melsea Hospital was a soldier of the 14th, named Wigby. He had laboured for nearly three years under a disease which was entered on the books as morbus coxarius, treated as such, and held to be a disease of the hip-joint, hopeless therefore, at that period, and irremedial by any medical or surgical means. At that time no proposals had been made by surgeons to excise the head of the femur under any circumstances whatever, and it was not with that view that I proposed to operate; but I felt convinced, from a variety of circumstances, that the joint was not implicated, and that the caries was actually confined to the upper and outer surface of the greater trochanter; but receiving no encouragement whatever from any of my colleagues, no operation was attempted, and the patient shortly afterwards died exhausted. On dissection, it appeared that the caries which destroyed this young soldier was limited to the outer surface of the great trochanter, was not larger than a sixpence, and might easily have been removed with a file or with the head of a trephine. Around the caries new bone had formed to some extent, similar to what happens in necrosis around the sequestrum. The preparation was lately in the museum of Chatham. The hip-joint was perfectly sound.

The second case which occurred to me strongly resembled the one just described; it occurred in 1825 or 1826. The patient was a farmer in Roxburghshire, and the case was to me so clearly a case of caries of the great trochanter, that I at once proposed the excision of that portion of the bone, the hip-joint being quite sound. As the gentleman had suffered greatly from exhaustion, it was proposed to remove him from his residence to the sea-side within a short distance of Edinburgh, with a view to his being near the surgeon, and also for the recovery of strength. The patient, however, fell into the hands of Mr. Liston, one of the great cutting surgeons of the day. He took advantage of the proposal sanctioned by my diagnosis, proceeded to operate at once, without informing me of it, and prior to the recovery of any strength; the patient, as was to have been expected, died. On dissection it was proved that the disease was confined to the trochanter major, the joint being perfectly sound.

It has frequently happened to me to observe on the bodies of healthy working persons, who died from various acute diseases, fistulous openings, which, though small, had evidently persisted for a long period. When such fistulæ have occurred in the limbs, I have traced them most frequently to some small and seemingly superficial caries in a deep bone (femur, tibia, etc.), so small that the whole disease might be covered with the point of the finger. The disease being incurable by any other but surgical means, continues, without extending, for years, the patient in the meantime enjoying very good health. At other times, however, the constitution gives way, exhausted by the discharge. No one can question the propriety of operating in such cases.

I now return to constitutional, or scrofulous caries, in which, although the disease may occasionally be confined to the trochanters, it unhappily more frequently extends to the joint itself, involving not merely the pelvic extremity of the femur, but the acetabulum itself. Should it appear after death that the vertebræ themselves were implicated in the disease, such a discovery need surprise no one. But let it be remembered, in criticising operations performed on femoral caries, complicated with disease of the vertebral column, that caries in these vertebræ is not an absolutely incurable disease, and that the operation, by removing at least one source of suffering, and that the greatest, does not necessarily aggravate the case nor reduce the chances of ultimate recovery.

*Case* 5.—Jessie Bulwer, aged 12. There is morbus coxarius, with dislocation of the femur. The operation of excision of the pelvic extremity of the femur was performed on the 12th October. On the 18th Dec. the patient was doing well. The head and cervix of the femur were carious, and the acetabulum was filled up with a soft, granulating mass, rendering it impossible to say whether or not the bone had been, in the first instance, diseased. Six months after the operation the patient died. She sank under the effects of a double psoas abscess, connected with and caused by caries of the lumbar vertebræ and of the sacrum. These facts were brought to light by a *post-mortem* examination. (See Mr. Cotton's case in 'Medical Gazette' for December, 1849, and July 6, 1850.)

Under more favourable circumstances this patient would have recovered. The thorax and the abdominal viscera were healthy, and nature had attempted to form a new head of the femur and a new joint, with diminutive trochanters for the attachments of muscles.

*Case* 6.—Humphreys, aged 8. There was morbus coxarius, with dislocation of the head of the femur. The operation was performed in 1847, and the patient recovered so far as to be able to move about on crutches whilst in King's College Hospital. Being sent to the country he improved in health, and in progression he could even use the limb by placing the toes on the ground. On his re-admission to the hospital, during the following summer, he had greatly improved in his general health, but there was a sinus above Poupart's ligament from which was a copious discharge. The abdomen swelled, and he died in August, 1849, nearly two years subsequently to the operation. On dissection it was found, as was to have been anticipated, that pelvic caries existed; the acetabulum was rough and carious, and perforated at one point. The liver was large and fatty; the state of the lungs is not mentioned in the report of Mr. Smith. It is further mentioned in the report, that "the head of the femur was rounded, and firmly bound to the dorsum of the ilium by a strong band of fibrous tissue." A new head must have formed there, and in some measure a new joint. A residence at the sea-side, under favourable circumstances, would no doubt have restored this patient to health, notwithstanding the untoward symptom of a diseased acetabulum. Patients recover from caries of the vertebral column much more extensive than the pelvic caries was found to be in the above case. The operation prolonged life, and the patient ought to have recovered.

Before I advert to the two cases operated on by Mr. Walton, I shall venture to make a few further remarks on some cases which have occurred to others, and been operated on with various success. The first of these which I intend noticing here, is the earliest, perhaps, on record, and one, therefore, meriting particular attention. The operator was Mr. White, and the details, to which, however, I need not advert at any great length, are exceedingly interesting. The brief history is as follows:

*Case* 7.—John West, aged 8. Affected with morbus coxarius and dislocation of the femur. Excision of the head and neck of the bone was performed by Mr. White, and the head and cervix were stated to have been but slightly carious. But their carious state may fairly be doubted, and it is unquestionable, although the important conclusion has escaped commentators on the case hitherto, that the disease had ceased to exist prior to any operation. But great deformity existed, to remove which was Mr. White's sole object in operating. So far, then, in this celebrated case, the operation was perhaps unwarrantable, as there really was no disease, the subcutaneous section of the adductor muscles being no doubt the proper remedy. Still the case did well, and stands recorded as a successful operation for morbus coxarius, which it was not. (See Cooper's 'Surgical Dictionary,' art. 'Bones.')

*Case* 8 has reference to a lad aged sixteen, affected with morbus coxarius, and dislocation of the head of the femur. This was a bold and successful operation. It was found, on operating, that the head of the femur was carious and wasted, and the acetabulum had suffered from the same disease. It was rough and bare, and, during the operation, Mr. Fergusson used the gouge. This patient recovered about a year after the operation; he was then moving about with the aid of a stick in a way which surprised every one.

It would thus appear, that pelvic disease, when not far advanced, offers no absolute objection to the excision of the head and neck of the femur in morbus coxarius. Incredible as it may appear to some, it recovers readily enough from constitutional caries. I have my doubts as to the extensive regeneration of structures; that this takes place sometimes may be admitted; but another process, namely, the healthy consolidation of the bone, and its conversion into an ivory or porcelain-looking structure, extending from the originally cartilaginous surface to a greater or less depth into the bone, will be found, I think, to be the more usual process towards a cure after dislocations from morbus coxarius and other diseases, destroying the cartilages and synovial surfaces of bones.

Other operations and other cases have not been so fortunate; that is, I presume, the materials for a correct diagnosis were wanting.—*Medical Times*, *June* 18, 1851, *p.* 689.

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## 78.—ON AMPUTATION OF THE FOOT AT THE ANKLE-JOINT.

By W. Fergusson, Esq., F.R.S., &c.

It may with truth be said to be peculiarly characteristic of modern operative surgery, that we avoid to the utmost of our power all great mutilations,—that, instead of amputating a considerable part of the body for a diseased joint, we are content, and indeed find ourselves able to cure the patient, by cutting out the diseased parts, and leaving him a more or less useful limb. Although this view regarding the objects of operative surgery cannot be said to be novel, it must be admitted that conservative surgery is more in the ascendency than ever, and it is a very good step in advance. I remember the time when, for disease of the ankle-joint only, the surgeon amputated the greater part of the leg, cutting the limb off just below the knee-joint; and I have myself often removed the leg for disease of the tarsus. Now, I hold it to be a sound maxim to preserve for the patient, while removing the diseased part, as much of the sound body as we possibly can, and the less of it we take away the more creditable it is for surgery. Again, I believe it to be a good and safe principle in surgery, that we should operate as far as possible from the trunk, and that by so doing we are putting our patient to less hazard; the shock of the operation will be much less; and this rule especially obtains with reference to amputations on the lower extremity. I believe it to be agreed among all surgeons, that the danger of the proceeding is lessened in proportion with the distance from the trunk. I speak, of course, in reference to the effects of the operative proceeding itself, and not to those accidental circumstances which may arise after any operation whatever.

For these reasons, then, I consider that amputation at the ankle-joint should always, when possible and proper, be put in force, instead of the old proceeding of removing a great part of a sound limb.

I have been particular in bringing this operation before your notice, because I think it creditable to surgery; and I am sure that if you should, in the course of your future practice, find it necessary to perform it, you will find it answer admirably, and, moreover, bring credit upon yourselves. But, although of late so much has been spoken, and so much has been written, respecting the advantages of this proceeding, I fear that it is by no means so well known and understood as it ought to be: certainly, if known, it is not practised so frequently as it should be. We see and hear of surgeons who still keep to the old method of amputating the leg for simple disease of the foot or ankle-joint.

Now, to show that this operation is probably not performed so often as it might be by surgeons in this metropolis, I may state, that Mr. Syme, in his comparatively limited sphere of observation—that is to say, as one of the Surgeons to the Royal

Infirmary in Edinburgh, a city containing about 200,000 inhabitants—has performed the operation more frequently than all the surgeons in London put together. I have had eight cases myself; my friend, Mr. Busk, of the *Dreadnought*, has had the same number, I believe; and beyond these, I do not think that there have been half-a-dozen instances of this operation altogether. This, as you see, gives a very small proportion to what has been done in Edinburgh; and it would appear from this, that either there must be a great many more cases in Scotland requiring this operation, or there must be much less of this sort of surgery here in London. I place no importance on the insinuation, that the operation may occasionallybe done in the north in instances where there is no absolute necessity for such a proceeding. The same practice has been resorted to by other surgeons in Edinburgh, as well as in Glasgow; and I have such a high opinion of the surgery north of the Tweed, both in the Royal Infirmary of Edinburgh and elsewhere, that I should consider myself an unworthy disciple, were I not to express my humble opinion in favour of the school from which I have myself derived so many advantages. From what I have observed, I should say, that surgeons here are not sufficiently impressed with the utility and superiority of this proceeding; and I am convinced, that amputation has been done frequently in the leg for diseases of the foot, when amputation at the ankle-joint might have been substituted with ease, and would have sufficed for the thorough removal of the disease.

What, then, are the advantages of this operation, you will ask, to counterbalance those disadvantages which have been urged against the proceeding, namely, its difficulty, its protracted nature, and also the liability there is to the lapse of a long period before the stump perfectly heals? To this I would bring two most cogent answers. In the first place, by adopting this operation instead of amputating in the leg, we preserve a great portion of the limb which is in a sound state, and nevertheless gain the same object, namely, the removal of the disease and the restoration of the patient to health. Secondly, I have no hesitation in saying, that the stump is the best that can be made in the lower extremity. You must bear in mind that I am only here alluding to those cases in which amputation of the foot is imperatively demanded.

Whilst making these observations upon the superiority of this operation, it would not be right in me to lead you to suppose that it is invariably successful, or that it is not sometimes attended by fatal results. Of the eight patients I have operated upon, two died after it; in one of them death followed directly from the proceeding in a few days, as it would ensue after any other amputation; great irritation and inflammation ensued, and quickly carried the patient off. In the second instance, it would not be fair to put the issue to the operation itself, as the fatal termination did not happen until several weeks after, and it was due to disease of the lungs, which had rapidly supervened after the foot had been removed. In some of my cases which have recovered, there have remained for some time those chronic sores which one frequently sees in a stump, or after excision of a joint for carious bone; but I lay no stress upon this matter, for it often happens that, when the skin has been diseased, even after the removal of the carious bone, sinuses will take some time in healing up: and I would beg of you to remember, that the fact of there being ulceration in the soft parts which are to form the flap, is no valid objection either to the excision of bone or to this operation. I am fully aware that surgeons refuse to do this amputation at the ankle when the soft parts are swollen and ulcerated; and I believe that this is one reason why it has been so little adopted, for there is nearly always a good deal of disease of the integuments in a case of caries of the ankle-joint or tarsus. But it is a very erroneous notion to believe, that this will act as any objection to the proceeding,—the disease in the soft parts is entirely produced and kept up by the irritation of the carious bone;—take the latter away, and the soft parts will, sooner or later, regain their natural condition. You recollect the last case in which I performed excision of the elbow-joint; there was most extensive disease of the soft parts around, through which it was necessary to make the incisions in the operation; nevertheless, after the carious ends of the bones had been removed, the parts resumed a most healthy condition; and the swollen condition, as well as the improvement afterwards, were so remarkable, that I had casts of the arm taken both before and after the operation. It has been the same with this last case of

amputation at the ankle-joint: the disease in the soft parts was very great; but look, now, at the stump, and you will see how healthy the skin appears. Bear this point in mind,—it is of the greatest importance; it is a principle that you cannot too firmly impress upon your minds, that disease of the soft parts around a carious joint is caused and kept up by the condition of the bone; and that, when this latter is removed, the former will resume a sufficiently healthy state to make a good covering. I particularly draw your attention to this point, as I feel certain it is not sufficiently acknowledged, or at least, attended to.

Before concluding, I will just make an observation on one other point. You have seen that a slough took place in the middle of the lower flap in this case. Now, sloughing has not unfrequently ensued in the lower flap after this proceeding, but it has usually attacked the anterior edge of it, not the centre, as in this case. But you readily understand how this was the case; the cicatrix of the wound made in the former operation was seated here, and of course the circulation was less healthy at this point; consequently, some sloughing took place there. Sloughing of the lower flap has often been observed; and, in order to obviate this, Mr. Syme has recommended a shorter flap than he at first made; and I have sometimes made even a shorter one than recommended by that gentleman. Here (showing a cast) is an instance where I carried the incision just over the posterior edge of the lower surface of the os calcis; a capital stump was made, and no sloughing occurred. It is desirable to make the flap no longer than is absolutely necessary. I have now drawn your attention to most of the points connected with this operation, which I strongly recommend to your notice; for by it you can remove effectually a serious disease from your patient without sacrificing a considerable portion of the limb which is in a sound state, and which may prove very serviceable to him afterwards.—*Med. Times, June* 14, 1851, *p.* 640.

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## 79.—ON THE OPERATION OF AMPUTATION AT THE ANKLE-JOINT.

By Richard G. H. Butcher, Esq., Examiner on Anatomy and Physiology in the Royal College of Surgeons, Ireland, &c.

The operation at the ankle-joint is no new thing. Mention has been made of it at a very remote period; it was, I think, first performed by Sedellier, and strongly advocated by Velpeau and many other French surgeons, both by antero-posterior as well as lateral flaps; but certainly to Mr. Syme is due the merit of having revived it altogether under a new aspect, by refuting the strong objections urged against it from the extent of the articulating surfaces exposed, and the scantiness of the covering for the bones. The former he has lessened by the removal of the malleoli, as first practised by M. Baudens, together with the intervening cartilage; and the latter he has shown can be supplied by an efficient flap from the dense tegument and tissues of the heel. The operation was also strongly opposed on the supposition that the exterior muscles of the ankle, acting through the tendo Achillis, when no longer antagonized, would draw up the heel, and point the cicatrix to the ground. Such a result cannot take place, Mr. Syme says, as the cut extremities of the tendons on the fore-part of the joint speedily require new attachments, enabling them to counteract the extensive power. Well, to a certain extent this proposition maintains, perhaps sufficiently so for all practical purposes; yet I have now before me a second cast, taken from the patient Flynn, just before I operated below the knee, an interval of three months having elapsed, and during which time he was hopping about on crutches, with the leg hanging, and the stump in every movement dragged on by the powerful muscles of the calf, not only during his efforts by this mode of progression, but also while he made ineffectual attempts to walk. On contrasting it with that taken on the former occasion, the result contradicts Mr. Syme's assertion that no change takes place in the line of the cicatrix. It is here demonstrated a full half inch lower; but, as I have before noticed, for practical purposes, this need not be taken into consideration, as it is improbable the parts on the anterior aspect of the stump would have yielded any more.

One of the advantages promised by amputation at the ankle-joint, instead of the operation near the knee, according to Mr. Syme, is "a more comfortable stump

will be afforded." In the case just detailed, we have evidence that the stump was perfectly formed in its most favourable proportions. The patient left the hospital with the cicatrix healed, and, as readily would have been supposed from an inspection of it, complete in every respect; yet what is the disheartening result? Why, that, after weeks of the gentlest trial, the cicatrix breaks out afresh, the limb becomes inordinately swollen, intense and burning pain fixes in the stump, occasioning restless nights and days of torture, and lastly he supplicates for its removal altogether.

The dissection of the stump reveals the causes of all his sufferings, and is extremely interesting. On lifting the indurated integuments, the subjacent layer of granular fat seemed more matted to the fibrous textures and firmer in its consistence than usual. The insertion of the tendo Achillis was so closely applied to the plantar fascia that it presented the appearance of dividing into three dense fibrous bands, passing from behind forwards to the cicatrix. These bands, on the most convex part of the stump, were separated from each other about half an inch; the spaces between were depressed and filled with fat. On making a section of the cushion from behind forwards, exactly in the mesial line, its depth was fully three-quarters of an inch, its structure fibrous, and eminently springy and elastic; this, together with the integument and fat removed, constituted a covering for the bones of an inch and a quarter thick, and formed of tissues most admirably adapted for the end in view. On examining the cicatrix, the anterior extremities of these fibrous bands, or three divisions of the plantar fascia, were fused into the cut extremities of the flexor tendons, the union between them being short and decided, and hence the improbability that the cicatrix would have descended any more by the action of the extensor muscles. On drawing away the cut surfaces, it was quite apparent that inflammation, terminating in ulceration, had attacked the cartilage over the articulating surface of the tibia, and also the end of the fibula, from which the external malleolus was removed. The cushion was not adherent to either; it remained firmly attached, however, to the tibia, where the internal malleolus was sawn across. In addition to the increased vascularity of the bones and structures around, there was a delicate adventitious membrane, which was capable of being lifted up, spread out over the eroded cartilage; red vessels permeated and traversed it in all directions, many of them visible to the naked eye, whilst with the assistance of a lens they appeared as a complete vascular net-work. Coexisting with this condition of the interior, ulceration was also eating its way round the margin of the cartilage. The morbid appearances presented in the parts were brought on, I have no doubt, by the patient's reiterated attempts to move about; and the darting pain occasioned along the thigh, when undue pressure was made at the inner side of the cicatrix, is referable to the bulbous condition of the nerve, for in this specimen it is very firm, and expanded to the size of a large almond. This pathological condition of the nerve, after amputation of the ankle-joint, is totally at variance with Mr. Syme's prediction when dilating on the advantages of the operation.

In the case just detailed I had no choice of site, the integuments being diseased; if I had, I should have preferred operating at the middle of the leg, or a little below it, the practice comes so strongly recommended from Charles White, of Manchester, now revived and practised by Professor Fergusson, of London, and so ably and forcibly urged by Dr. Laurie, of Glasgow; in short, conservative surgery was never so much in the ascendency as at present, and no man can recognise or estimate the principle more fully than I do. Yet I think it still remains to be proved that the operation at the ankle-joint affords the most comfortable and useful stump to the labouring man, and promises less risk to life. No doubt many cases are on record where the operation was performed, in some instances attended by great success. Lisfranc mentions the case of a man on whom this operation had been performed, who could walk ten or twelve miles a day with great ease, and a few similar cases are recorded by Professor Syme. In most of the published favourable cases, however, we have evidence of a prolonged confinement for the healing of the stump; but after this no reference is made to its usefulness in progression, neither have we full statistics as to the mortality attending it. I have seen the operation performed three times, and in no one case was it attended with success.

Professor Fergusson has written "On the Amputation of the Foot at the Ankle-

joint" in the 'Medical Times' [see p. 185 of this vol.] and speaks most favourably of the proceeding; yet he tells us:—"Whilst making these observations upon the superiority of this operation, it would not be right in me to lead you to suppose that it is invariably successful, or that it is not sometimes attended by fatal results. Of the eight patients I have operated upon, two died after it; in one of them death followed directly from the proceeding, in a few days, as it would ensue after any other amputation; great irritation and inflammation ensued, and quickly carried the patient off. In the second instance, it would not be fair to put the issue to the operation itself, as the fatal termination did not happen until several weeks after, and it was due to disease of the lungs, which had rapidly supervened after the foot had been removed." This mortality, then, twenty-five per cent., I look upon as very considerable, more particularly when occurring in the hands of this distinguished surgeon. It is greatly to be regretted that Professor Fergusson did not allude, in his lecture, to the present condition of the remaining six of his cases, whether the stump in each case fulfils efficiently the object for which it was intended, and whether any of the patients solicited amputation in preference to being incumbered with a useless limb.

From my own observation, and the facts now detailed, I do not consider this operation at all so applicable to the poor labouring man as to the wealthy sufferer. The latter may at will relieve the stump from pressure, by expensive mechanical contrivances, horse and carriage exercise, &c., &c.; whilst the former, no matter what amount of uneasiness he may experience in the part, must endure and struggle on for subsistence, and probably in the end have to submit to another operation.—*Dublin Quarterly Journal of Med. Science, Aug.* 1851, *p.* 216.

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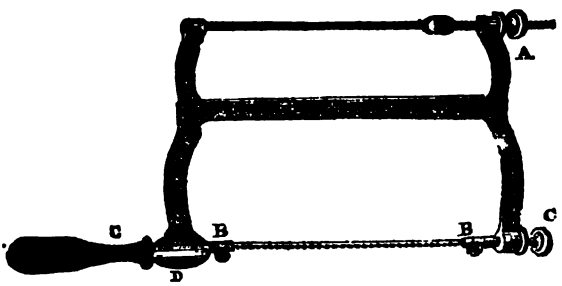
## 80.—ON THE APPLICATION OF A NEW SAW IN AMPUTATIONS.

By Richard G. H. Butcher, Esq., Examiner on Anatomy and Physiology in the Royal College of Surgeons, Ireland, &c.

[Mr. Butcher describes it as follows:]

The saw which I most strongly recommend now, for the first time, to the profession, is a modification of the bow-saw used by cabinet-makers for cutting out fine work, when curves are to be executed. The construction of the instrument will be readily understood by the description appended to the wood-cut, in which the saw is exhibited on a very reduced scale.




A, the nut applied to the screw, which makes tense the blade; B B, the pins that screw the blade in the sockets; C C, the handle and nut, by turning which the blade is rotated to any angle; D, the rest for the index finger.

The measurement of the full-sized instrument is as follows: the upright pieces are six inches high, half an inch wide, and two lines thick; the one remote from the handle is received into the transverse bar, and is moveable; the depth of the blade is three lines, with the teeth well set off from each other, and inclined forwards; the length of the blade is six inches, with the sockets included, eight inches and a half; the middle bar is half an inch deep, and two lines thick, and the upper bar is rounded, with a screw at one end.

The instrument, for amputation of the leg and thigh, I have had made of the above proportions, but it is also executed on a smaller scale for minor operations.

I have also, at this moment, in the hands of the cutler a saw preserving the same proportions of blade, with a screw to make it tense, directly attached to the remote socket from the handle of the instrument; by this contrivance the upper bar, and a great proportion of the uprights, can be done away with, so as to render it more portable.

The advantages which I conceive this saw possesses over every other, are the following: from the extreme shallowness of the blade, it readily cuts in a curve, if required; and from its slender proportions it can be easily slipped under the flaps and used without bruising them, or catching in the retractor. No matter how unsteadily or unevenly the limb is supported and held by the assistant, the saw cannot be locked; the thin shallow back, the fine setting of the teeth, the mode in which they project to either side, all contribute to prevent the possibility of such an occurrence, for a perpendicular section of the blade shows it to preserve a triangular form, the base below, therefore the instrument must work freely in the groove which it has made. It cuts more evenly than any other saw, and the bones cannot be splintered by it, consequences resulting from the fineness of its setting, and the lightness of the instrument; and lastly, it cuts more rapidly than any other saw, owing to the extreme tension of the blade, produced by acting on the screw in connexion with the upper bar of the instrument; the effect being perfected in a very material manner by the mode in which the blade is riveted in a direct line with the teeth.

This saw will be found extremely useful in every instance where a saw is required, and particularly in amputation of the lower jaw; for, by relaxing the screw above, the sockets in which the blade is lodged are permitted to rotate, so that the teeth may be directed outwards, while, by unscrewing the pin marked B, the blade is readily detached, and being sharp at the point, is easily passed behind the bone, with its edge applied to it, or at any angle required; the blade is again fastened at B, and when made tense, a few movements of the instrument will readily sever the bone from within outwards.

Again, owing to the facility it affords in cutting curves, it is peculiarly applicable for removing exostosis, cutting out the great trochanter of the femur, &c.—*Dublin Quarterly Journal of Med. Science, Aug.* 1851, *p.* 214.

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## ORGANS OF CIRCULATION.

### 81.—DEEP PENETRATING WOUND OF THE CALF OF THE LEG, BY A REAPING-HOOK, FOLLOWED BY PROFUSE HEMORRHAGE.

By E. L. Hussey, Esq., Surgeon to the Radcliffe Infirmary, Oxford.

[This wound was produced accidentally, by means of a reaping-hook, upon the person of Isaac Carter, 66 years of age, and of feeble general appearance. It is described as "on the middle of the back part of the left leg, extending in a transverse direction about two inches, penetrating deeply into the muscular substance." On Mr. Briscoe, the house surgeon, removing the handkerchief which had been tied round the leg immediately after the infliction of the injury, a gush of arterial blood followed, and it was found that the wound extended further than the finger could reach, on the tibia and interosseous membrane, under the deep muscles.]

It was clear that some deep-seated vessel of magnitude was wounded, which it was imperatively necessary to secure; and as it did not seem prudent to wait, I proceeded to search for it, without sending to Mr. Hitchings, whose week of attendance it was.

A tourniquet being thrown round the thigh, and the man placed on his side, with the limb partly flexed, I made an incision about four inches long through the skin upon the inner edge of the gastrocnemius, over the course of the posterior tibial vessels, meeting the tibial extremity of the transverse wound at about a right angle, and, dividing the other tissues interposed, came at once upon the anterior tibial artery, both ends of which were seized and tied without difficulty: the distal extremity, though easily recognised, was not bleeding. The artery, as well as the nerve, was completely divided by the original injury. The clots in the

wound were then turned out, and some muscular branches which seemed inclined to bleed were next tied. Profuse hemorrhage still continued with violence, but of a dark venous character, welling up from the bottom of the wound; this, however, became lessened on removing the tourniquet. To get at the source of it I enlarged the wound upwards towards the knee, and some bleeding points were tied upon a tenaculum,—an operation of great difficulty, from the patient's restlessness and the depth of the wound. One vein, larger than the rest, and apparently in close connection with some tendinous structure, seemed to be wounded at more than one point. Ultimately the hemorrhage was stopped by passing three ligatures, at intervals of half an inch, under this vessel and the surrounding tissues by means of a needle in a firm handle. The wound was drawn together with strips of plaster, a compress of dry lint placed on it, and the whole secured, and even pressure maintained by a bandage round the leg; and the patient, cold and perfectly pulseless, replaced in a blanket in bed. Wine and brandy were administered freely during the operation, and on his return to bed he was supplied well with hot brandy and water.

About nine o'clock at night Mr. Hitchings saw him: he was then warm; the pulse was weak, but distinctly perceptible at the wrist. The finger placed on the dorsum of the feet distinctly recognised, for the first time, the anterior tibial artery: the posterior could not be felt. He was still as restless as ever, throwing himself about, and with difficulty kept in bed: he had twice torn the bandage off the leg, without, however, any return of hemorrhage. The muscles could be seen acting spasmodically under the bandage. A drachm of spiritus etheris sulphurici compositus, with forty minims of vinum opii, was administered in mistura camphoræ: it was speedily vomited, when a grain and a half of opium in substance was given and retained. He continued very restless till towards three o'clock in the morning, when he went off to sleep.

[On the succeeding day he seemed to have rallied a little. There was a slight watery discharge from the wound, tinged with blood. Beef tea and brandy and water were administered, and as no urine had passed, the catheter was introduced. On the 14th, however, fatal symptoms supervened, and he died quietly forty-eight hours after receiving the wound. On a post mortem examination being made, it was found the ligatures had been correctly placed on the divided extremities of the posterior tibial artery. The three additional ligatures had been placed upon one of the venæ comites. The tendon of the plantaris lying immediately over the vein had interfered with the application of the ligatures. It would have been better to have divided this tendon. The extremities of the vessel were nearly an inch distant from each other, owing to the retraction of the muscles. The cause of death was evidently from the inability of the system to rally from the severe loss of blood previous to admission.]

The chief point of interest in the case is, that it shows with what ease the posterior tibial artery may be exposed when necessary, in the upper part of its course, by cutting through the muscles covering it; and the unfortunate termination of the case does not seem a sufficient reason for withholding the publication of it. The operation, I venture to suggest, may be done by cutting upon the edge of the gastrocnemius, and then through the substance of the soleus, with less difficulty—as it seems more directly in the course of the vessel, which there lies at less depth—than by cutting, as proposed by Mr. Guthrie, through the belly of the gastrocnemius as well as the soleus; though that operation seems more practicable than the older mode of cutting upon the edge of the tibia, and reflecting the muscles attached to it, notwithstanding the preference given by Dr. Harrison, of Dublin. This mode of operating was suggested to me some years ago by Mr. Coote. On the *dead subject* it appeared undoubtedly to be preferable, but I had not till now had an opportunity of putting it in practice on the *living*.—*Med. Gazette*, 1851.

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## 82.—ON THE TREATMENT OF ANEURISM BY COMPRESSION.

By Jolliffe Tufnell, Esq., Surgeon to the City of Dublin Hospital, &c.

[Although Mr. Tufnell, on the part of his Dublin professional brethren, does

not wish to discard the ligatures, he still prefers pressure as the general rule in ordinary cases. He says:]

"I *consider compression applicable* to every ordinary circumscribed aneurism in an extremity, where there is sufficient room for the application of the compressing medium at two different points above the tumour, premising, of course, that pressure on the trunk of the vessel completely controls pulsation in the sac, thus proving that no high bifurcation exists.

"*I do not advise* it in cases which are rapidly extending in size, or where they continue to do so after compression has been tried. These aneurisms have no distinct sac; and to afford any chance of saving the limb, the blood through the main channel *must be cut off, and at once*, by securing the vessel.

"*I do not advise or sanction it* in cases where the disease has been allowed to run on unchecked, where the limb has become œdematous and swollen, and the surface of the aneurism a dusky, yellowish red. In such a case, the vein is most probably engaged, and if it be a popliteal aneurism, the knee-joint inflamed. Here, I believe, amputation is the only resource.

"Understand me, then: compression I advocate only in cases where the sac is entire, and where sufficient room exists for applying the pressure on two points of the artery above. At the same time, cases have so frequently occurred where the application of a single instrument has been sufficient for a speedy cure (such, for instance, as one that I saw under the care of Dr. Hutton, where popliteal aneurism of a considerable size, was, in seven hours and a half, by means of a single instrument, constructed on Dr. Carte's plan, rendered completely solid), that, although, for prudence sake, *and as a general principle*, I advocate the employment of two points of pressure, yet I by no means hesitate to employ a single instrument, and give the patient every chance, prepared at the same time to use the ligature, if any necessity arise."

In preparatory and constitutional treatment, Mr. Tufnell follows Dr. Bellingham. In selecting the instrument to be employed, he discards all but a conical weight from six to ten pounds, padded, laid upon the artery at the groin, and retained there by the patient's hand; with the elastic apparatus of Dr. Carte. In this apparatus, Indian rubber takes the place of, or rather relieves, the pressure of the unyielding screw; an important improvement, which, however, may be easily accomplished in various ways by those who do not possess Dr. Carte's instrument.

The author advocates such an amount of pressure as stops pulsation in the aneurism to the *touch*, in which case the ear will still detect the flow of blood into the sac. He urges us to employ the minimum amount of pressure with which *complete* command over the circulation can be obtained, with the view of obtaining a more rapid cure than when a wave of blood is permitted to pass through the sac; although in irritable persons less pressure may be attempted, as aneurism is cured by a mere diminution of the current of blood through the tumour. Cases are also quoted, proving that when it has been necessary to suspend compression, a curative action still goes on. The temporary interruption to the current of blood appears to line the inside of the sac with a fibrinous deposit, which increases in thickness and completes the cure.

It is an important question to determine how far the employment of compression interferes with the subsequent application of the ligature, should it be required from the intolerance of pressure or increase of the aneurism. Of course a careless practitioner might so injure the artery, that it would be dangerous to apply a ligature upon the part he had compressed; but Mr. Tufnell quotes from cases where an opportunity has been afforded of examining the limb after death, proving that no injury whatever was inflicted upon either artery or vein, at the spots where compression was applied. He quotes from other cases, in which compression was given up and the ligature employed, the previous use of compression in no way affecting the operation in its results.

That compression is an *effectual* cure for aneurism, is proved by the fact that, during eight years, the ligature has only been used three times in Dublin, either in hospital or private practice, in two of these cases the aneurism being traumatic. During this period, compression has been employed in 39 cases. In 30 of them, a perfect and complete cure was the result. In one, compression was discontinued, and the tumour did not increase in size. In two, the ligature was used successfully.

In three, amputation was necessary, the patient surviving in each instance. Three patients died; one from erysipelas, and two from disease of the heart. It is quite clear, from the details of the cases in which amputation became necessary, that the ligature would not have lessened the necessity for removal of the limb; but, on the other hand, would have almost certainly induced gangrene, and thus lessened the probability of saving the patient's life. The death from erysipelas occurred during a prevalence of this disease in the hospital, galvano-puncture having been employed, and the patient himself having unduly increased the amount of pressure.

The average duration of treatment in these cases, was twenty-five days. The average of the eight most favourable cases was only twenty-eight hours. In one case, seven hours and a half only were required for total solidification of the contents of the sac. There can be no doubt that, from the admission of a patient to the time he leaves the hospital, after the employment of the ligature, a longer average stay than twenty-five days takes place, and that a very speedy cure cannot be hoped for.

Statistical returns of the success of the ligature give the following results:—

"In Dr. Crisp's work are detailed the particulars of 188 cases, where the vessel was secured for popliteal or femoral aneurism. Of these—

| | |
|---|---|
| Died from the effects of the operation ... ... | 35 |
| Recovered after suffering subsequent amputation ... | 11 |
| Recovered after sloughing of the sac ... ... | 2 |
| Recovered after mortification of the toes ... ... | 1 |
| Recovered after sloughing of the integuments ... | 1 |
| | 50 |

So that more than the fourth of these cases either terminated fatally, or were maimed for the rest of life.

"Mr. Phillips's experience and researches are the next to be considered. They are thus quoted by Mr. Storks:—'Mr. Phillips collected 171 cases of aneurism affecting the lower arteries, which were submitted to the Hunterian operation. Of these cases, 57 (or exactly one in three) were unsuccessful, in which all the patients except two died, not of the disease, but of the operation. Amongst the successful cases, secondary hemorrhage took place fifteen times. Fifty-nine of these cases required ligature of the femoral artery, 39 of which were unsuccessful; thus giving a mortality of two in three in the artery most frequently subjected to the operation.'

"Mr. Norris gives a fuller report, his table embracing 177 instances (155 of popliteal, and 22 of femoral aneurism) where the operation was performed. He gives the surgeon's name, the sex and age, situation of disease, its duration, periods when each operation was performed, when the ligature came away (if fatal), the date and cause of death, with reference as to where the particulars of each case are recorded. There is, then, no getting behind this collection, no stating, in general terms, that statistics are wrong, and cannot be relied on. If truth is spoken in the first published details, it is re-echoed in Mr. Norris's table.

"He gives, I say, 177 cases, of which—

| | |
|---|---|
| Died from the effects of the operation ... ... | 38 |
| Recovered after subsequent amputation ... ... | 6 |
| Recovered after suppuration of the sac ... ... | 10 |
| Recovered after gangrene of the foot ... ... | 2 |
| | 56 |

So that nearly one out of every three cases operated upon, either terminated fatally, or were, to a certain extent, maimed for the remainder of their lives."

[These returns will doubtless assist in convincing the profession, that compression must become the general, ligature the exceptional, practice in the treatment of aneurism.]—*Brit. and For. Medico-Chirurg. Review, October*, 1851, *p.* 468.

## 83.—ON NÆVUS.

By John Birkett, Esq., Assistant Surgeon to Guy's Hospital.

*Case* 1. *Very large Nævus of the Right Arm,—Spontaneous Atrophy.* [In January, 1850, an infant, 10 months old, was brought to the hospital. The whole of the right upper arm was of a deep purple tint, the external and anterior regions being most affected, the disease extending on to the shoulder, and slightly also to the chest, reaching downwards a little below the flexure of the elbow. On account of the age of the patient, pressure, and the liquor plumbi diacetatis dilutus, were applied. In April, the constitutional powers of the child were greatly reduced by an attack of measles, succeeded by whooping-cough. In October, the site of the nævus resembled a very large cicatrix after vaccine pustule, having a whitish opaque appearance. Mr. Birkett continues:]

I am inclined to think that the atrophy which has taken place in this instance must be attributed to the very low condition into which the powers of nutrition were brought first, by the attack of measles; and, secondly, by the effects of the whooping-cough, which ensued so rapidly, indeed, before the constitution had recovered from the former.

I am induced to make this statement from having witnessed a similar case of atrophy in an infant under the care of Mr. Hacon, of Hackney.

This infant was the subject of a large subcutaneous nævus, occupying the side and the lower half of the face, and a portion of the neck. In this case, also, the extent of the growth, and the very tender age of the patient, precluded every idea of operation. This infant, a few weeks after I saw it, had a most severe attack of bronchitis, and Mr. Hacon informed me that after recovering from this pulmonary affection, the nævus became atrophied.

M. Vidal cites three cases of atrophy:—

1. Of a large cutaneous nævus on the cheek, which, by the advice of M. Moreau, was allowed to remain without any interference. About the age of seven or eight years it began to atrophy, and at twelve there was no trace of it.

2. Of a cutaneous nævus, equal in size to the first phalanx of an adult's middle finger, on the forehead of a female infant close to the anterior fontanelle. By M. Moreau's advice this was untouched, and at seventeen years of age there was not a trace of it.

3. Of an erectile tumour occupying the left labium pudendi, and extending into the vagina, which atrophied as the patient advanced in age. (Vidal, 'Traité Path. Ext.,' t. i. p. 426.)

In these cases it is not stated that the patients had any severe illnesses.

In correspondence with Mr. Henry Taylor, of Guildford, he favoured me with the following case and remarks:—

"There is a fact with regard to these vascular growths that I have observed several times; it is this, that they will go away of themselves, and it is a fact that I do not remember to have seen mentioned in surgical books, although of so much practical importance. One instance of it was so remarkable that I must relate it to you. A child was born in 1847 with a tumour on its head, near the vertex; it was the size of a walnut, of a spongy consistence, and had a sort of thrilling in it when compressed. The scalp was slightly discoloured over it, and there were some large arteries coming to it from the middle temporals, and these were fully as large as crowquills, tortuous, and pulsated visibly. I did not like to meddle with it at such a tender age, fearing the effects of hemorrhage, so the operation was deferred from time to time until it was found that the tumour was getting smaller, and at ten months old it had entirely disappeared. The other cases were the common cutaneous nævi, and in each of these, operations were meditated."

A case fell under my own observation of an infant born with several nævi on various parts of its body. They were left to nature, and have disappeared.

Cases, however, occur in practice in which it is neither prudent nor perhaps justifiable to induce the parents of the infant to delay the performance of some operation, with the intention of arresting the progress of these vascular growths. The case next to be recited is such an instance, for it appeared that the disease was advancing slowly but steadily, and in a region of the body where the dimensions of the growth would render the complications which might therefrom arise a *matter for* serious consideration.

[The following case illustrates a method of treatment not much employed hitherto, whereby the nævus is strangulated, excluding the skin in the operation.]

*Case 2.—Subcutaneous Nævus, or Growth of Erectile Tissue on the side of the Face, tied with a Subcutaneous Ligature.* In July, 1850, I saw, for the first time, a female infant, eleven months old, having a swelling on the right side of the face. She was delicate looking and very strumous, born in Australia, and was still at the breast. The mother stated that the first suspicion of there being anything abnormal in the part, arose from the side of the face looking as if bruised. Believing that the child might have received some injury, she did not apply for medical advice until she discovered that the bluish tint increased rather than disappeared, and that the cheek assumed a somewhat swollen appearance. So difficult was it to form a diagnosis at first, that various opinions as to its nature were given, some thinking it chronic abscess, others medullary fungus, and some nævus. When the mother first remarked the blueness, the infant was about two months old.

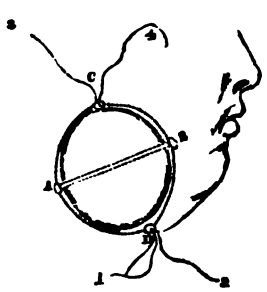
When I saw the infant in July, there was not, under certain circumstances, much difficulty in forming a diagnosis.

When the child was erect and the face in shade, there appeared to be considerable swelling of the right side of the inferior maxillary facial region, and a decided enlargement was perceptible on manipulation.

A large globular swelling extended from the lobule of the auricle half way across the inferior maxilla, and from an imaginary line drawn transversely across the masseter muscle downwards, into the upper cervical region. It was, in fact, external to the angle of the lower jaw. It communicated a peculiar elastic sensation when pressed, and with gentle pressure might be reduced in size. When, however, the pressure was removed, the tumour assumed its original volume. The colour of the swelling was of a very faint blue, and corresponded to that of the veins in other parts of the face, although the superjacent skin was perfectly healthy. Having concluded that the tumour was composed of the so-called erectile tissue, in fact that I had before me a beautiful example of the subcutaneous nævus, I requested Mr. Cooper to examine the infant with me. He formed a similar diagnosis, and then we had to decide about the treatment. He thought it would be better to watch the progress of the growth, rather than immediately to have recourse to operation. This I did, seeing the infant from time to time, and always with the same result, namely, that the disease increased. In the beginning of September, the growth had made so much progress that Mr. Cooper agreed with me in thinking that delay was no longer admissible, and on the 16th I operated upon it, having the valuable assistance of Mr. Francis Toulmin, who had seen the case from time to time.

The infant was placed under the influence of chloroform, and during nearly the whole time of the operation, she was under its effects.

Grasping the tumour with the finger and thumb, I passed a needle, armed with a silk ligature, transversely beneath the growth, and thus carried two ligatures from side to side.




I next passed the ligature 1 through the eye of a needle, and thrust its point from the first aperture A underneath the skin to C, where it emerged, and was drawn out. In the same way the ligatures 2, 3, and 4, were passed subcutaneously. The ends of the ligatures were next tied, as firmly as possible, at C and D, and thus the two triangular masses were constricted by the silk, without the skin being at any point included. (See Sketch.)

The bleeding was not very great after the tightening of the ligatures, although from one puncture a jet of apparently arterial blood came forth.

The irritation caused by these ligatures was not at all equal to what I had anticipated, and, with the exception of restlessness at night and irritability by day, the infant could not be said to have suffered very severely.

A discharge of pus soon appeared from each of the apertures, and continued in variable quantities from day to day.

At the end of a fortnight the ligatures had become loosened, and I passed a piece of bougie through the loop of each, by twisting which the tissues included in the ligatures were constricted. On the 17th day, both ligatures came away, and the discharge was of a healthy character. The side of the face was much diminished, and in the seat of the new growth a firm consolidated centre became perceptible. The bluish tint entirely disappeared, but there remained a slight redness over the old site of the nævus.

In October a little discharge flowed away; sometimes from one, at other times from another puncture.

I believe, however, the growth might be said to have been destroyed.

The health of the child did not suffer much, it became perhaps a little thinner, and on the opposite side of the neck there appeared an enlarged gland, probably depending on the strumous diathesis of the infant. This suppurated, discharged, and soon after healed.

For several weeks I believed that the disease was radically cured, but, to my disappointment, about Christmas, 1850, the same bluish tint and swollen appearance of the cheek reappeared, rather posterior to the original site of the disease, and of small size. The growth gradually increased, not to its former extent, but it became sufficiently manifest that a new development had taken place. I did not propose further interference, and for the last few months no increase has arisen. But it is somewhat remarkable that the skin over the nævus, before quite unaffected, now presents some minute bright red ramifications of blood-vessels. The cicatrices of the holes made by the needles are scarcely perceptible.

The subcutaneous ligature of Ricord has been now employed in various forms in the treatment of these cases, and the first I find is by Professor Pitha, who, in 1844, with great success made use of it to destroy a vascular tumour on the forehead of a young man twenty years of age. The growth was encircled by a single ligature. (Vierteljahrschrift für die prak. Heilkunde. Prag, 1847.)

Mr. Curling has also devised a plan of proceeding in those cases in which the preservation of the skin is important, by passing a single ligature subcutaneously. (Medical Gazette, 1850.)

And since I performed the operation related above, Mr. Adams has attempted to cure an abnormal development of this kind by the same means. (Med. Times, Feb. 1851, p. 178.)

The following methods of treatment for the cure of nævi have each their advocates, and are more or less beneficial, according as the nævus may be of the cutaneous, subcutaneous, or mixed variety.

They may be severally arranged under the three following heads:—

1. To induce or await atrophy of the new growth, by—
   - *a.* Compression.
   - *b.* Astringents or refrigerants.
   - *c.* Ligature of the vessels of supply.
2. To excite inflammation in the tissue of the nævus, and thus obliterate the cells of the new tissue, by—
   - *a.* Seton.
   - *b.* Acupuncture.
   - *c.* Laceration of the tissue by punctures.
   - *d.* Incision and the insertion of sponge.
   - *e.* Cauterization with potassa fusa, chloride of zinc, &c.
   - *f.* Injections of stimulating solutions.
   - *g.* Punctures, with a probe coated with argenti nitras.
   - *h.* Vaccination.
   - *i.* Punctures, with a lancet's point covered with croton oil.
3. The entire removal of the new growth, by—
   - *a.* Excision of the disease only.
   - *b.* Amputation of the part affected, as of lips, prepuce, labium pudendi, fingers, &c.
   - *c.* Ligature in various ways.
   - *d.* Complete destruction with caustics.

In the case I have related, I was led to employ the subcutaneous ligature, in consequence of the position of the morbid growth; for to have included the skin which was perfectly normal, would not only have rendered the operation more formidable, but, by causing extensive destruction of the integuments, would have given rise to a frightful cicatrix, even supposing the healing had been perfect. The plan adopted has not, moreover, in any way interfered with the performance of another operation, should the growth increase to such an extent as to demand further interference.—*Guy's Hospital Reports, Vol.* 7, 1851, *p.* 291.

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## 84.—CASES OF NÆVI.

Under the care of Mr. Erichsen.

*Nævus of the anterior fontanelle.*—A child, six months old, strong and healthy, was admitted, under the care of Mr. Erichsen, Nov. 1850, with a nævus on the anterior fontanelle. The tumour is almost as large as a pigeon's egg; it occupies the whole of the fontanelle, extending over the osseous boundaries of this space on the left side. The heaving of the brain can be distinctly felt underneath it; there is no pulsation in the tumour, but several large veins are seen running from it on each side. The mother states that she noticed the discolouration of the skin shortly after birth; it increased rapidly since that period, and almost visibly during the last fortnight.

Mr. Erichsen resolved to use the ligature, seeing the size and prominence of the growth: but the difficulty in the application of this means consisted in passing the threads across the base of the tumour without wounding the membranes of the brain, which lay in immediate contact with it. This difficulty Mr. Erichsen overcame by using a blunt-eyed probe to convey the threads, instead of the common nævus needle. A puncture was therefore made about an eighth of an inch above the tumour, and an eyed probe, conveying the whipcord, was pushed across the base of the mass. Mr. Erichsen then cut down upon its point when it projected below the tumour, and then drew it across; the transverse threads having been carried through in a similar manner, the knots were tied in the usual way, and the mass firmly and effectually strangulated; the child, having been under the influence of chloroform, suffered no pain. The threads and sloughing mass separated in three days, leaving a healthy granulating surface, which speedily cicatrized.

[Mr. Lloyd treats nævi by destroying them by potassa fusa freely applied for a few minutes. Mr. Luke some years ago published a description of ligaturing nævi by carrying a single thread having several needles strung upon it across the tumour, then cutting off the needles, and tying the knots. In the following case Mr. Erichsen only used one needle and a double thread, a plan at once simple and successful of accomplishing the same objects.]

A child, two years old, was admitted, on the 23rd October, 1850, under the care of Mr. Erichsen, having a nævus on the right side of the forehead, about two inches long, three-fourths of an inch broad, and slightly elevated above the skin. Various but unsuccessful attempts having previously been made to destroy it with caustic, Mr. Erichsen proceeded to use the ligature, which he did in the following manner with complete success:—

A long triangular needle is threaded on the middle of a whipcord about three yards in length; one-half of this is stained black with ink, the other half is left uncoloured. The needle is now entered through a fold of the sound skin, about a quarter of an inch from one end of the tumour, and transversely to the axis of the same. It is then carried through, until a double tail, nine inches in length, is left hanging from the point at which it entered; it is next carried across the base of the tumour, entering and passing out beyond its lateral limits, so as to leave a series of double loops at least nine inches in length on each side. Every one of these loops should be made about three-quarters of an inch apart, including that space of the tumour, and the last loop should be brought out through a fold of healthy integuments beyond the tumour. In this way we have a series of double loops, one white and the other black, on each side. All the *white* loops

should now be cut up on one side, and the *black* loops on the other, leaving hanging ends of thread of corresponding colours.

The tumour may now be strangulated by drawing down and knotting firmly each pair of white threads on one side, and each pair of black ones on the other. In this way the tumour is divided into segments, each of which is strangulated by a noose and a knot; by *black* nooses and *white* knots on one side, by *white* nooses and *black* knots on the other.

Mr. Erichsen thinks that this mode of applying the ligature will be found of service in all those cases of elongated flat nævi, in which, from the shape of the tumour, it is not possible to effect the strangulation by the ligature as ordinarily used, without inclosing an undue quantity of integument, and thus producing a larger cicatrix than is necessary for the eradication of the disease. The ordinary double ligature, or the quadruple thread, as used and figured by the late Mr. Liston, always includes a circular mass, and hence is not applicable to those growths that are very much elongated or irregular in shape.

[The following is a good case of cellulo-venous nævus, taken from the notes of Mr. Ashton, and under the care of Mr. Erichsen.]

A child of about five years of age came under Mr. Erichsen's care in February last, for a large tumour on the right nates. The parents state that shortly after birth some swelling was noticed about the right buttock, but it did not attract much attention until the child was about three years old, when it received a smart whipping from the grandmother in this region of the body. The tumour now increased slowly in size until it attained its present bulk. The integuments covering it also became mottled with purplish-red spots. No treatment of any consequence has been had recourse to for the removal of the growth.

On admission, a tumour as large as an orange is found on the nates of the right side, occupying the fold, and extending into the ischio-rectal fossa. It is very prominent, not distinctly circumscribed, and doughy throughout the greater part of its extent; but where it approaches the anus, it is of very firm consistence. The size of the tumour can be slightly diminished by steady pressure; but on the removal of the hand, its former bulk is speedily regained. It is not influenced by the child crying or struggling, and the skin covering it is mottled here and there with faint claret-coloured stains. There is no pulsation, bruit, or increased heat in the swelling.

Mr. Erichsen having diagnosed the tumour to be a cellulo-venous nævus, partially consolidated by inflammation, proceeded to remove it on the 6th of March.

Ice having been applied before the operation, with the view of lessening the vascularity of the tumour, Mr. Erichsen made a crucial incision through the integuments covering it, and reflected these to the base of the tumour, exposing a large mass, apparently composed of much-dilated and tortuous veins and cellular tissue, with a few cysts containing brownish fluid. Nævus needles were pushed across the base of this, and it was strangulated with strong whipcord.

In a few days the tumour included in the ligatures sloughed away, leaving a deep hollow from which it had been removed. The surface of this cavity and the contiguous flaps now took on a peculiar unhealthy action; instead of granulations, large greyish-white masses, looking like melted fat more than anything else, were thrown up; the flaps became swollen and œdematous, and it was feared that a malignant degeneration was taking place.

The child's general health was carefully looked to, and potassa fusa freely applied. On the separation of the sloughs produced by the use of this caustic, the same morbid condition was, however, set up again; and as the parts in the vicinity became extremely irritable, it was thought advisable not to re-apply it.

Various local applications of an emollient or specific character were now used, but none could be borne; indeed, water-dressing appeared to be the only application that did not irritate.

The surface of the ulcer gradually assumed a healthier appearance; the flaps became less swollen; they lost the peculiar semi-transparent appearance which they had before presented, and the parts around evinced less irritability. But yet, every now and then, a tendency to a return of the former morbid appearance presented itself. This, however, gradually passed away. By the middle of May, about two months after admission, the child left the hospital, with the wound soundly and

completely cicatrized, and with no appearance of disease about it.—*Lancet, July 12, 1851, p. 32.*

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## 85.—CASES OF HEMORRHAGIC DIATHESIS.

By Alfred Poland, Esq., Assistant Surgeon to Guy's Hospital.

John R——, æt. 19 months, was admitted in December, 1849, with hemorrhage from the frænum of the upper lip. The child was exceedingly delicate, waxy, pale, and exsanguineous; and had received a blow on the lip the previous week, which was attended with great loss of blood. Caustic was freely applied, which effectually checked it for two days, when bleeding occurred, and was again stopped for another day. However, hemorrhage ensued a third time; and continued off and on up to the time of admission. Various remedies were now tried, but to no effect, until the pure nitric acid was freely inserted into the wound, which effectually answered the purpose. About six months afterwards the child was again brought to the hospital in a similar plight. There had been no recurrence of bleeding until two days before, when it broke out afresh, and resisted all efforts to arrest it. Remedies, consisting of alum, matico, nitrate of silver, &c., &c., were tried for three hours, when nitric acid was applied, and succeeded as it had previously done.

[James R——, brother to the above, æt. 6½ years; whilst looking out of the window and drawing in his hand suddenly, bit his tongue, which bled profusely. This continued until three o'clock next day, and remained uncontrolled in spite of the repeated application of the nitrate of silver.]

Several astringents were tried, as also nitric acid, which failed; the under surface of a matico leaf was then applied to the wound, and an infusion of matico given internally. This did not succeed; and about eleven o'clock, p.m., Mr. Poland applied the actual cautery, which stopped the hemorrhage. On the following day the child's body and extremities were found to be covered with large patches of purpura, looking like bruises after injury. He was ordered meat and vegetables, lemon juice to drink, and ten grains of chlorate of potash in water three times a day. Under this treatment, persevered in for three weeks, the boy perfectly recovered.—*Guy's Hospital Reports, Vol. 7, 1851, p. 329.*

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# ALIMENTARY CANAL.

## 86.—ON RESTORATION OF THE UPPER LIP.

By R. J. Mackenzie, Esq., Junior Ordinary Surgeon to the Royal Infirmary, Edinburgh.

[From the comparative rarity of disease of the upper lip requiring extirpation, and consequent removal of parts, little attention has hitherto been bestowed upon attempts to restore the lost parts in this situation.]

Blasius, Dieffenbach, and others, have successfully restored the lost upper lip by flaps, cut in different ways, from the cheeks; and in cases where the upper lip alone has been destroyed, it will not require much ingenuity on the part of the surgeon to effect the restoration in one of these ways.

In cases of hare-lip in which the cleft was unusually wide, so as to amount nearly to absence of the upper lip, the edges of the wide cleft have been allowed to be brought into apposition by cutting through the whole thickness of the cheek, in a line curved upwards from each angle of the mouth. I have resorted to this proceeding, and have more than once seen it successfully practised by others, in cases of deficiency of the greater part of the lip, when the soft parts in the situation of the cheek were in a sound condition.

These modes of operation are suited for cases where the upper lip *alone* is deficient, and in which the cheek has not been involved in the injury or disease by which the parts have been destroyed. One of the most common causes, however, of destruction of the soft parts of the face is *cancrum oris*, as well as the mortification which occasionally attacks these parts during fever and the eruptive diseases of children, and in such cases the cheek seems rarely to escape the ravages of the disease.

Two such cases have lately presented themselves in the hospital, in both of which, from the destruction of the cheek which had taken place, it was impossible for me to restore the lost parts by any method, as far as I know, hitherto practised; and it is to the plan which I have adopted in these cases that I am anxious to direct attention. It has proved in the following case successful in removing the extreme deformity which existed, and promises, I think, in similar cases, to answer the purpose in view satisfactorily.

The subject of the first operation was a girl, of eighteen years of age, who when between two and three years of age, lost her entire nose, nearly the whole of the upper lip, and the greater part of the right cheek, from mortification, the sequela of an attack of fever. She subsequently grew up a strong and healthy girl, and was in the enjoyment of excellent health when she entered the hospital (12th March, 1851) with the determination to submit to anything which could be done for the removal of her excessive deformity.

The sketch gives a good representation of the appearance of her face. The hard palate was widely cleft from exfoliation of the superior maxillary bones, which had taken place in nearly the whole extent of the roof of the mouth. Her articulation was very indistinct, and, as she spoke, her tongue protruded through the opening of the alveolar arch. The remains of the right cheek were drawn in by a thin cicatrix, which adhered to the superior maxillary bone above the angle of the mouth. The integuments of the brow were ample, and in excellent condition for the formation of a new nose; and the only difficulty lay in the restoration of the lip, which evidently could not be effected by incisions, however extensive, through the remains of the cheek.

The only plan by which it appeared to me the lost parts could be restored was, *the transposition of the lower lip to the situation of the upper*, whilst, at the same time, by extending the incisions under the base of the jaw, the integuments in that situation might be brought up to replace the lower lip, according to the plan recommended and successfully practised by Mr. Syme. The incisions required to effect this were pretty extensive; but it appeared to me that any measures, however severe, were warrantable, if they held out the prospect of at all effacing the hideous appearance which the girl presented, whilst she herself was most willing to submit to anything which was likely to effect this end.

The operation was performed (19th March) in the following manner:—After removing a slice from the free border of the remains of the upper lip on the left side (Fig. 1, A A), and freeing this part from its adhesions to the gum, I made a curved incision (E C) from about an inch outside the angle of the mouth through the whole thickness of the lower lip to about its centre, and parallel with the border of the lip. A second incision (B C) was then made, at right angles with the termination of the first, and prolonged downwards under the base of the jaw, in the manner practised by Mr. Syme in the restoration of the lower lip. The *prolabium* of that part of the lip included in the excisions was then removed, and a cut surface (F) made in the natural situation of the base of the upper lip, by removing the cicatrix from the nostril to the right angle of the mouth. The two flaps formed by these incisions were then dissected fully back, and the bleeding vessels were secured by ligature. The upper flap was then raised and united (as

FIG. 1. FIG. 2. FIG. 3.

shown in the diagram, A A, to B C, and D to F) in the situation of the upper lip, whilst the lower and larger flap was brought up and united to the cut surface of the lower lip and chin.

The right half of the lower lip was thus made to occupy the situation of the upper, whilst its place was supplied by the flap from beneath, and the right side of the mouth was now formed by the incision (E C) between the two flaps.

Fig. 2 explains the position of the parts when united in their new situation.

The operation was tedious and embarrassing from the unsteadiness of the patient, owing to the extreme difficulty of bringing her under the full influence of chloroform,—a difficulty which was experienced previously in removing two projecting teeth, and equally so afterwards in the operation for the restoration of the nose. She suffered from very little constitutional disturbance, however, and perfect union of the parts was obtained in the course of a few days.

A new difficulty, however, presented itself in the contraction of the mouth, which, in spite of all endeavours to prevent it, went on till the entire granulating surfaces of the two flaps had united. This contracted state of the mouth was afterwards obviated to a considerable extent by an incision, in which the integument and mucous membrane were divided at different levels. The mucous membrane was then everted and united to the skin, so as to form a *prolabium* for the upper lip, whilst the skin was similarly inverted and united to the mucous membrane of the lower lip. The mouth was thus enlarged; but a small portion of the lower lip was unfortunately lost by sloughing, which has left a slight permanent deficiency at the lower part of the angle of the mouth.

About ten weeks after the first operation, when the parts were firmly cicatrised in their new situation, the nose was restored by bringing a flap from the brow. The operation was performed in the usual way, with the exception of the *columna* being taken from the scalp, according to the Indian method. This was done as it was thought better not to interfere further with the new lip, which would have been considerably diminished in size by raising a *columna* from its centre.

About a month after the formation of the nose, the collateral circulation of the new organ being well established, I divided the twisted neck of the flap, and attached it in the usual way.

The sketches show the result of these operations. The front face is from a daguerreotype, which, with a sketch of the profile, was taken five months after the formation of the lip, and three months after the restoration of the nose. The

nose appears large,—a fault which, I need scarcely add, is unlikely to be permanent.

The chief difficulty met with in the progress of the case arose, as I have observed, from the obstinate contraction of the mouth; and the error committed in the operation, which gave rise to this difficulty, consisted evidently in the removal of the *prolabium*. This inconvenience, I have since found, may be avoided by preserving the *prolabium* of the lower lip in its situation, and uniting it to the flap brought up from over the base of the jaw.

The lines in Fig. 3 will serve to explain the situation of the incisions by which this object is attained; and if the method of operation I have described is thought worthy of performance, this modification of it (the preservation of the *prolabium in situ*) will be found of the greatest advantage in obviating the contracted state of the mouth.

The second case, in which a somewhat similar operation has been performed, was that of a girl, of eight years of age, who, when two years old, suffered in a similar way to the preceding case, from mortification of the face during fever. The same parts were destroyed as in the case I have related; but the left half of the upper lip had retained its vitality. The whole of the soft parts, however, between the eye and the lower lip had been lost, a small portion of the lower eyelid at the outer angle only remaining. From the contraction during cicatrisation, the remains of the angle of the mouth had been drawn upwards close to the eye. The nose, too, had been entirely destroyed. In this case I attempted to restore the lost parts by bringing up a large flap, consisting of the lower lip (saving the *prolabium*, as in Fig. 3), and integuments over the base of the jaw, so as to fill up the whole gap at once; but the result of the operation was unsuccessful, from an unforeseen accident. From the effects of the chloroform, which had been administered pretty freely during the time of the operation, the poor child vomited with little cessation, for thirty-six hours. From the long-continued drag thus made on the sutures, union failed in the entire extent of the wound, and the flap, in spite of all means used to keep the edges together, gradually retracted and receded from the surface to which it had been attached. By a second operation, however, the flap was united to the remains of the upper lip. The upper lip has thus been completely replaced, and, from the preservation of the *prolabium* (as shown in Fig. 3), the natural size, position, and appearance of the mouth has been entirely restored.

The restoration of the eyelid and a small part of the cheek, which are still deficient, may in this case be accomplished without much difficulty; whilst no obstacle exists to the formation of a new nose by a future operation.—*Monthly Journal of Med. Science, October*, 1851, *p.* 348.

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## 87.—INSTRUMENT FOR APPLYING ELECTRIC HEAT IN DENTAL OPERATIONS.

By George Waite, Esq., M.R.C.S., Surgeon-Dentist.

[The importance of the employment of electric heat was first suggested to Mr. Waite by the late Mr. Murphy, of King's College. On this suggestion he determined to apply it to destroy the pulp of decayed teeth. Mr. Waite was then persuaded to take out a patent for it, and sent a drawing of his invention to the 'Illustrated Catalogue of the Great Exhibition.' He describes it as follows:]

I use (he says) a Groves's battery with eight cells. When using it I have in my hand a holder with two copper wires passing through it, one positive from the battery, and the other terminating in a groove in the holder and fastened to a spring, by which I make or break contact at will with the negative wire. To the further end of the two wires a thin platinum wire is connected, and on the battery being charged and contact made, this takes suddenly the electric heat.

The efficacy and simplicity of the process being so decided, I am enabled to use it for many purposes, viz., to evaporate quicksilver from cements, and render them much less injurious to teeth than they otherwise would be; also where too great sensitiveness exists, and which prevents the operator from removing the caries; where gums have receded and left the necks of teeth highly sensitive to the touch;

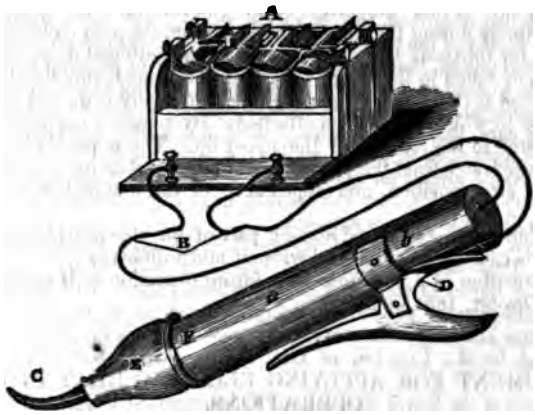
where teeth are affected by mollities which cannot by other means be combated; where teeth have to be pivoted, and when vitality remaining in the root would subject the patient to serious inflammation; where teeth have been broken or cut, or filed, and left sensitive to cold and warmth; where violent toothache exists; where hemorrhages come on, or slight bleeding into the cavity, preventing a continuance of any operation.

The electric heat retains its force differently to all other heat which can be applied to the mouth; the platinum wire can be placed, without the patient being aware of it, near the part affected, heat can be produced almost momentarily, and suddenly deadened, and as a most interesting phenomenon, and one which has surprised me very much, in patients of a highly nervous temperament where I have expected much suffering, none has been endured on its application. It would be superfluous here to detail many interesting facts which the use of electric heat will discover to the scientific dentist; these philosophy explains with the laws of the sensitive faculty. It is my sincere hope that operators will be judicious in the use of this agent, and not bring it into disrepute by ill-judged and ill-timed applications.

In many cases it will be found equally efficacious when holding it near the teeth, as if they were touched by it.

Care must be taken not to continue its application too long, as it will burn up and blacken the part it touches.

As time passes on, I look forward to its use being generally understood, and it will then give rise to many improvements tending to the benefit of society.—*Lancet, June* 28, 1851, *p.* 703.




This plate represents the electro-dental apparatus ready for use. A, Groves's battery; *a*, an ivory-holder pierced with two grooves, one of them open at the end; B, the copper wires, one terminating at *b*; C, the platinum point; D, a spring to make contact with the wire which terminates at *b*; E, a mouth-piece unscrewing at F, and in which the platinum and copper wires are connected.

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## 88.—ON THE DESTRUCTION OF THE DENTAL PULP, &c. BY THE HEAT OF ELECTRICITY.

[Acting upon Mr. Marshall's suggestion, Mr. Thomas H. Harding, of London, in a letter to the editor of the 'Medical Times,' describes the following simple apparatus whereby this purpose is effected by means of platinum wire. He says:]

The apparatus, as ultimately employed by me, may be thus described. The battery, which of course may vary according to the choice of the operator, but which it is so desirable to render as elegant and simple in arrangement as possible, is constructed on a plan similar to that of the large battery now employed by Mr. Marshall, which I believe he shortly intends to describe. It consists of only

two pairs of plates contained in a single cell, and is set in action by one fluid, viz., dilute sulphuric acid. The terminal six inches of the poles, which are of copper wire plated, are supported on an ebony or ivory handle, upon the side of which one of these poles is interrupted at a particular point. The extremities of the poles are connected by a piece of platinum wire 1-109 of an inch thick and ¼ of an inch long, which is bent into a loop. The sides of this loop are then brought parallel, and nearly close to each other, without touching, and it is thus introduced into the pulp-cavity of the tooth to be operated on.

By a slight pressure on one side of the ebony handle, the interrupted pole is temporarily joined, and the platinum wire immediately becomes brilliantly heated, as it lies in contact with the tooth-pulp. Sometimes, however, I have found it desirable, in the first place, to complete the galvanic circuit and thus heat the platinum wire before bringing it to bear on the exposed pulp. The flexibility of the loop of wire enables the operator to bend it in any direction previously to use. In this way I have succeeded in rapidly destroying the pulp of decayed and condemned teeth, and have proceeded, after a few minutes, to the operation of filling with gold or with Ash's metallic pasté. I have also destroyed, with the greatest ease and rapidity, the pulps of incisor teeth, cut off for the purpose of being pivoted.

It is obvious that this method is applicable either for the simple cure of tooth-ache, or as a preliminary step to the operation of filling. I am aware that there is nothing novel in the use of the hot wire for destroying the nerve of an aching tooth. The old village doctress has long ago cured tooth-ache by the thrust of a hot needle or pin; and dentists occasionally use a heated wire. But the difficulty has been felt of applying the wire easily, and at a duly elevated temperature. In the method just described, this is surely, readily, and instantaneously accomplished. The vitality of the tooth-pulp is thoroughly destroyed, and it is even so far consumed or carbonised, that the operations of filling or pivoting may be at once proceeded with, instead of having to be delayed. Owing to the extreme fineness of the wire employed, the local heat, though intense, is very limited in its action, and, with due care, the tooth-substance need not suffer any appreciable injury. It may also be remarked, that in operating on some teeth, I have found, by completing the galvanic circuit on approaching the teeth, that the light given out by the incandescent wire, aids, very remarkably, in giving a perfect view of the exact point at which the tooth-pulp is exposed.

In conclusion, I can only say, I beg confidently to lay this method before the notice of the Profession, as the most ingenious and simple contrivance yet invented for the object in view, and as one which, I think, will be very generally adopted. It will give me pleasure to exhibit the apparatus and mode of operating to those who are interested about it; and I may add, that the apparatus itself will be constructed by Mr. Coxeter, of Grafton-street, East.—*Med. Times, June* 28, 1851, *p.* 702.

[At a meeting of the Royal Medical and Chirurgical Society]

Mr. MARSHALL narrated a case of fistulous perforation of the right cheek, in a strumous man, twenty-five years old. A fine platinum wire, 1-50th of an inch thick, was passed through the fistula, so that its ends could be connected with the poles of a Groves's battery, consisting of four cells, each having a platinum surface of thirty-two square inches, and a zinc surface of thirty-eight square inches. The galvanic current was kept up for nine seconds; but little pain was felt from the action of the heated wire; sloughs appeared at both orifices of the fistula; that on the inner orifice came away on the fifth day after the operation; the outer one was separated on the sixth day. On the eighth day, the inner opening was closed; on the eleventh, the outer opening was also closed. A smaller sinus was discovered some days afterwards on the inner surface of the cheek; and by a repetition of the operation, was also cured within a fortnight. Mr. Marshall had employed the *electric cautery* in rectal fistulæ and in internal and external hæmorrhoids, with success. He anticipates that its employment will occasionally be found more advantageous than the knife, scissors, or ligature.—*London Journal of Medicine, July*, 1851, *p.* 670.

[Mr. LEACHMAN recommends for this purpose an electro-magnetic coil, as used by Mr. Faraday. He says]

The use of a large battery is attended with much inconvenience and expense. In lieu thereof, I would recommend the employment of an electro-magnetic coil. It was found by Mr. Faraday, ('Experimental Researches in Electricity,') that on connecting the ends of a stout insulated copper wire, 100 yards in length—wound on a hollow reel, into the interior of which a piece of soft iron was inserted, to form an electro-magnet—with the poles of a small battery, consisting only of a single pair of zinc and copper plates, excited with dilute acid, the intensity of the electricity induced in the coil on breaking connexion with the battery was sufficient to fuse a piece of platinum wire one-hundredth of an inch in diameter and half an inch in length, interposed in the circuit. By lessening, however, the power of the battery, either by diluting the acid or exposing a smaller surface of metal to its influence, the intensity of the electricity induced in the coil might be so adjusted as to heat the platinum wire to the required temperature only. One of Mr. Smee's half-pint cells would, I think, be found to afford ample power. The apparatus of Mr. Waite, a description of which, with a diagram, is given in your journal, would with this arrangement be equally applicable and advantageous.—*Lancet, July 5*, 1851, *p.* 24.

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## 89.—ON OBSTRUCTION OF THE INTESTINE WITHIN THE ABDOMEN.

By R. R. Robinson, Esq., late President of the South London Medical Society, and formerly Surgeon to the London Dispensary.

[Speaking of the causes producing the obstruction, Mr. Robinson states that, although contraction of the bowel and the formation of bands, &c., are the *real* causes of obstruction, yet they are not the sole cause; for these are, for the most part, sudden and violent exercise, and errors in the quantity or quality of the food. As to the diagnosis, it is not easy to state the exact nature in the early stages. It may be confounded with colic, enteritis, stricture, malignant disease, and introsusception. Internal strangulation resembles at first colic; but afterwards the pain becomes more violent and constant, with vomiting, ultimately stercoraceous. From enteritis, the diagnosis is comparatively easy; and as stricture is generally confined to the rectum, an examination will easily clear the case. From malignant disease, the countenance, and the rapidity of its course, and more persevering constipation, would distinguish it; but from introsusception no symptoms can clearly and unerringly detect it.]

*Diagnosis.*—Respecting the mode of distinguishing one kind of obstruction from another, great difficulty must, necessarily, be felt. If I may draw any inference from one case (and I am very unwilling to do so), I should say that the free relief of the bowels, the result being nevertheless fatal, would serve to distinguish obstruction, the effect of contraction of the peritoneal coat of the bowel, from strangulation, resulting either from the twisting of the mesentery, or the formation of false bands. According to Mr. Mackenzie, the following will serve to diagnose dislocation of the sigmoid flexure of the colon: "In these cases, while all the symptoms of strangulation and obstruction of the bowels are present, there is one symptom never absent, which, respect being had to the history of the case, leads to a correct diagnosis, viz.—that it is impossible to throw up injections, per rectum, in any quantity; for, as soon as the gut is filled up as far as the twist, which is always low down, the fluid injected flows out as fast as it is thrown up, independent of any action of the intestine itself. Besides, the introduction of the long tube is impracticable, being always arrested at the obstruction."

Dr. Barlow, in an interesting paper in Guy's Hospital Reports, endeavours to diagnose the *situation* of stricture of the alimentary canal, by the *amount* of the secretion of urine, and cites cases in point. "It seems," he says, "that where there existed a perfect obstruction in the upper part of the small intestines, there was almost a total suppression of urine; where there was a diminution of the calibre of the canal, in the same situation, the urine was diminished in quantity; and where the small intestines were free, and the obstruction was seated in the colon, the urine was very abundant." Should future experience confirm these statements, a very valuable diagnostic mark will be obtained; but in Dr. G. Bird's

case, and in some of those which I have related, the obstruction was seated in the ileum, and yet there was no perceptible diminution of urine, so that more facts are wanted to establish this point. At present it seems probable that where the *duodenum* is the intestine affected, non-secretion of urine will be noticed.

*Treatment.*—In the treatment of this dangerous malady, the following indications present themselves:—1. To open the bowels; 2. to subdue inflammatory action; 3. to support the strength; 4. to remove the obstruction.

1. *To open the Bowels.*—As constipation is one of the most constant, and, at the same time, earliest symptoms, to relieve the bowels is certainly the first indication; and this may be attempted by,—*a.* purgatives; *b.* injections; *c.* the warm bath; *d.* nauseating remedies; and *e.* bleeding.

*a. Purgatives.*—Great judgment is, I think, required in the selection of purgatives, as, if they do not effect their object, they do much mischief; for it is questionable whether the ulceration met with in the mucous membrane, in many cases, may not be in part owing to the unsuccessful use of drastic and violent purgatives. Had I grounds for suspecting that a case was one of intestinal obstruction, from any of the causes mentioned, I would endeavour to liquefy the motions, so that, if possible, they might pass the stricture in a fluid form. For this purpose I would give one large dose of calomel, to be succeeded every two hours, if the stomach would permit it, by drachm doses of sulphate of magnesia, in peppermint water; and, did these not succeed, I would rub croton oil on to the abdomen, or try one drop of croton oil internally. Should these fail, I would give up the use of purgatives, feeling assured that the obstruction was much too complete to be overcome by their means.

*b. Injections.*—Purgatives failing to procure action from the bowels, recourse is naturally had to injections, which should, in the first instance, consist of the compound extract of colocynth, dissolved in water; but when a tympanitic state of the bowels occurs, turpentine, or the tincture of assafœtida, is to be preferred. So far, however, as my experience goes in these cases, injections avail but little; and I shall hereafter relate a case where seventy-two injections were administered without any apparent beneficial result.

*c. The Warm Bath* is a remedy which it would be very proper to use in the earlier stages; but, as the disease advanced, the strength of the patient being much exhausted, would scarcely justify its trial. Fomentations, often useful, and always soothing, should be used in all cases, especially where there is pain.

*d. Nauseating remedies*, in a strong and robust individual, might deserve a trial. Of these, perhaps, the two best are tartarized antimony, and the tobacco injection; but I should not be very sanguine of obtaining success by their means.

*e. Bleeding* may be now and then resorted to, in the earlier stages, in the robust and plethoric; but bleeding, carried to any great extent, I consider objectionable, for reasons to be stated hereafter.

2. *To remove inflammation* is a point to which particular attention should be directed; and, perhaps, there is but one thing of more consequence than this, for if it be allowed to go on unchecked, it may destroy the patient; and yet, if too vigorously attacked (by reference to the cases it will be seen that, in some, it was entirely absent, and, in almost all, limited, and by no means severe), the patient may sink from other causes. I think, therefore, that general bleeding will seldom be called for on this account; the application of leeches, fomentations, and the administration of small doses of calomel and opium, will be all that is required for removing or controlling peritonitis brought about by this cause.

3. *To support the strength.*—I am very anxious to lay great stress upon this point, because I do not think it has been sufficiently attended to in practice; and I feel sure that patients have been largely bled, who would have had a better chance, had the vital fluid been less unceremoniously abstracted. If the bleeding be not sufficient to effect its object, either in opening the bowels by its depressing effect, or by removing the peritonitis by its antiphlogistic power, it must, if carried to a great extent, do infinite harm, as it will tend to depress the vital powers, already at a low ebb, and thus take away, I may say, every chance, either from the efforts of nature, or the resources of art. In the absence of fever, and where the stomach would allow of it, I would give, from time to time, barley water and chicken broth in small quantities. Where there is great restlessness and want of

sleep, and where I had failed in the use of purgatives, and determined no longer to administer them, I would certainly advise the administration of opium, as, by so doing, I should hope to tranquillise the nervous system; for nothing tends to exhaust the frame so much as long-continued nervous irritability; and cases are on record showing the good that has been done with it occasionally. If I employed opiates, I should prefer solid opium to every other form,—first, as being more likely to be retained by the stomach; and secondly, as possessing a stimulating as well as sedative property, which, I think, would, in these cases, be decidedly advantageous.

4. *To remove the obstruction* is one of the most important and difficult questions connected with this subject, and one upon which much difference of opinion exists. It is clear that this can only be done with certainty by means of an operation; and two cases have lately occurred, in which encouragement has been given to this plan. In one of the cases (Mr. Hilton's) the bowel was so far liberated, that the intestinal contents passed through the obstructed part. In neither of the cases, however, did the patient long survive. In considering this subject, four points are to be entertained: A. the likelihood of finding and removing the obstruction; B, the place of performing the operation; C, the time at which it should be undertaken; D, the chance of success that may attend the attempt.

A. *The likelihood of finding and removing the obstruction.* Upon this point, there can be no doubt that there is great uncertainty; for although, in both the cases to which I have alluded, the obstruction *was* detected and removed, yet in one (Mr. Hilton's case) very considerable difficulty was experienced; and in case 16, had an operation been undertaken, the incision would, in all probability, have been made to the *right* of the umbilicus, as a decided induration was evident there, and not elsewhere, and a pouch immediately above it. It was natural, therefore, to suppose that this was the point of obstruction: whereas, on dissection, this proved to be merely hardened scybala; and the fatal incarceration was situated in the upper and posterior part of the *left* side of the pelvis.

B. *The place of performing the operation.* Mr. Phillips says: "There are some cases where the seat of obstruction is so clearly indicated, that *no doubt* remains. In such cases, I apprehend the rule is evident,—the incision should be made as near as is prudent to that point. But supposing the point of obstruction to be only obscurely marked, or indeed not discoverable at all, then I consider the incision should be made on the median line, because an opening in that situation may be found most convenient for liberation, if that be practicable; or, for the establishment of an artificial anus, supposing liberation of the intestine be not accomplished." The case, however, to which I have just alluded, induces me to think the central incision, as recommended by Dr. Crisp, preferable in all cases where the obstruction is seated in the small intestines.

C. *The time at which an operation should be undertaken.* It is very difficult to lay down any decided rule for this. Mr. Phillips says, that interference by surgical operation is justifiable when three or four days have passed without any relief from the bowels by ordinary means, providing constipation be complete, and fæcal vomiting continue. I scarcely think we are justified in operating so soon; partly because persons have recovered from constipation of twenty-three days' continuance, and partly for reasons which will appear in the sequel.

D. *The chance of success* I regard as a very important consideration before undertaking any operation; and I cannot think that cases of internal intestinal obstruction, even under favorable circumstances, offer much chance of a successful issue from operation.

In the cases to which I have referred, it has been said, that, had an operation been performed earlier, a different result might have been obtained; and no doubt, in both cases, delay was caused by the unwillingness of parties interested to give their consent. Can it be a matter of wonder, when it is recollected, that if an operation be undertaken, both the patient and surgeon must be prepared to go *all* lengths? The obstruction may *not* be at the part suspected; it may be *some way* from where the operation was commenced, and a *very large abdominal section* may be required to complete the operation; and it may possibly not be completed at all. How can this be undertaken without very considerable risk? How can such an operation be *proposed early*? And how can any better justification be urged

for such a proceeding, than that long since advanced by Celsus: "Satius est anceps remedium experiri quam nullum?"

If it be true, that great difficulty attends the finding these obstructions, and great danger follows the attempt at removing them by the knife, so that we cannot conscientiously recommend it but as a forlorn hope, it is but reasonable to inquire, whether any other expedient can be resorted to for a similar purpose. And this naturally induces me to ask whether nature ever produces a cure, or whether spontaneous relief is ever obtained? Several cases are on record, where persons with the symptoms I have described, and, to all appearance, sinking from internal obstruction, were suddenly relieved in the bowels, and gradually recovered. A case is alluded to by Mr. Cooper where this happened. An elderly lady, residing at Norwich, was under the care of Mr. Colman, suffering from constipation of the bowels, having had no evacuation for four days. The usual purgative remedies were prescribed, but without effect; enemata and more drastic cathartics were tried, but still ineffectually; vomiting and immense distension of the abdomen supervened; the symptoms became more and more urgent, and, on the twelfth day from her attack, she had had no relief from her bowels. Dr. Alderson was then called in, and asked *what purgative* he would recommend: to which he replied —"None; but a large dose of opium." It was given, and *in a few hours* the bowels were freely opened, and the patient recovered. What was the precise condition of this lady must ever be open to doubt; but I venture to suggest that this might have been a case where the bowel was strictured by false membrane, that inflammation and ulceration of this band ensued, and that then the gut was liberated; and I am the more inclined to think so from what is observable in Fig. 5, in which the band seems to be undergoing the ulcerative process; and I feel convinced that, had the patient lived a little longer, it would have entirely given way, and the patient might possibly have recovered. It is this conviction which makes me lay so great stress upon keeping up the strength of the patient; for as newly-formed parts are less organized than those formed originally, there is a hope, if the strength of the constitution be kept up, that the band may give way before the bowel, and the patient's life be saved. It is from this case that I particularly recommend the renewal of the old plan of metallic mercury; I think its use has not been rightly understood. That it will remove an introsusception, or enable a portion of bowel to be drawn out of these bands, I agree with Mr. Hilton, is not at all likely to happen; but that it might in favourable cases (Mr. Hilton's was not one of that sort), by exciting a pressure upon the bowels, break through a false band, I verily believe; and I am more strengthened in this idea by the good that has occasionally followed its use. I have heard of a case, which I believe was of this kind, where metallic mercury appeared to remove a very obstinate constipation, and the patient recovered; and my friend Mr. Lawrence of Brighton, has mentioned to me, and kindly allowed me to make public, the two following instances, which are cases in point.

In one, a boy, æt. 10, was seized, without any apparent cause, with constipation of the bowels, but with no sign of inflammation. He was bled, leeched, took drastic purgatives, and had seventy-two glysters administered. On the twenty-first day of the disease, no motion having been procured, ℥iij of metallic mercury were swallowed; no effect following, the same quantity was repeated on the twenty-third day, after which he felt great weight in the abdomen, and voided, with much forcing, an immense quantity of fœcal matter, and all the mercury, minus 3ss; almost fatal syncope followed, but the boy eventually recovered. The other was a case of similar kind, of shorter duration; it occurred in an elderly lady. All purgatives proving unavailing, two doses of metallic mercury, of ℥iv each, were given; several motions (and all the mercury, minus 3j) followed its exhibition after six hours, but the exhaustion and the depression occasioned were such as to destroy the patient. For these reasons, I think metallic mercury again worthy of a trial; it *can* do no great harm, and *may* do good. That it will often fail, I have not the least doubt, especially where the obstruction is low down, and has been so great as to ulcerate or destroy the coats of the bowel; but where, on the contrary, the band is thin, and high up in the canal, where the constriction is not so great as seriously to engorge or injure the part constricted, where the system does not sympathise much with the local malady, and where the powers

of life remain vigorous, I am not without hope that it may *occasionally* succeed; and if *but one case* should occur in which, from what I have said, a trial of this remedy should again be made with success, I shall consider my observations not altogether out of place.

[The conclusions Mr. Robinson arrives at are:]

1. The ileum is that part of the intestinal canal where internal obstruction is most likely to occur.
2. Membranous bands (probably the result of former peritonitis) are the most frequent cause of obstruction.
3. Partial is more likely than general peritonitis to lead to obstruction.
4. All the convolutions of the intestines may be united together without obstruction.
5. Mechanical, although the direct, is not the sole cause of obstruction, as there is reason to suppose the mechanical cause has been in existence some time before the symptoms show themselves; other causes must therefore arise to produce them, and the most frequent of these are sudden and violent exercise, and errors in the quantity or quality of food.
6. It is *possible* for a spontaneous cure to arise from inflammation and ulceration of an obstructing band.
7. The same consequences are seen in internal intestinal obstruction as are seen in other obstructed canals—viz. hypertrophy and dilatation above the stricture; atrophy and contraction below it.
8. The symptoms vary considerably in different cases.
9. The order in which the symptoms arise is as important as the symptoms themselves.
10. There are no symptoms by which one obstructing cause can be clearly distinguished from another.
11. The duration of the disease varies much in different cases.
12. The strength of the patient should be maintained.
13. Bleeding should be employed with great caution.
14. The seat of obstruction may be very apparent, and yet deceptive.
15. An operation is only justifiable as a forlorn hope.
16. As a rule, when an operation is resorted to, the central incision is to be preferred.
17. There is reason to believe that metallic mercury has proved useful; and it is in obstruction from membranous bands chiefly, if not solely, that benefit is to be expected from its use.—*London Journal of Medicine, July*, 1851, *p.* 593.

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90.—*On the Treatment of Umbilical Hernia in the Adult, by the use of a New Apparatus devised by* M. BOURJEAURD. Under the care of Mr. CURLING, in the London Hospital.—The apparatus is composed of a broad belt of vulcanized Indian rubber, about twelve inches broad, in which the elastic webbing is, according to M. Bourjeaurd's method, disposed in distinct circular or spiral bands, about half an inch wide. These being sewn together, produce a gentle, continuous, and permanent pressure, and always afford an equal amount of support to the patient, whatever posture he may assume. This belt draws on with great ease, and adheres perfectly to the waist. In order to give some more support posteriorly, M. Bourjeaurd has adapted vertically two flexible and somewhat resisting bands running on either side of the spinal column, so as to take off a portion of weight from the anterior part of the abdomen, these bands yielding to any movement of the trunk backwards.

The most ingenious and useful portion of the apparatus is a pad filled with air, which is fixed to the internal aspect of the belt, exactly opposite the umbilical protrusion. The air-pad is shaped for each individual case, according to the size of the ring, upon the circumference of which it exercises a gentle and constant pressure. The pad being sufficiently yielding, a portion of it insinuates itself into the ring, while the remaining part of it presses, without undue force, on the surrounding skin and muscular structures; and the vitality of the latter is thereby not

destroyed, as happens under the pressure of hard bodies. The great desideratum was to afford the patient wearing this belt the faculty of increasing or diminishing the pressure at the various periods of the day, when such changes are necessary. This is effected by means of a semi-elastic strap, fixed on the external portion of the belt, and running round the latter exactly over the air-pad. Thus, by tightening or loosening this strap, the patient may regulate the pressure as he pleases.

It is plain that breathing or coughing will be accompanied by no uneasiness with this belt, as the sac, in any violent effort, does not come into contact with any hard substance, as, for instance, ivory, but with a yielding though sufficiently resisting surface. This belt seems, then, to combine great advantages, and to be superior to the steel springs in general use; for it seems to act in a more uniform and external manner than the spring which presses on two points only.

That the faculty of moving the body in various directions was appreciated long ago, is evidenced by the improvement introduced by the late Mr. Hey, of Leeds. It is well known that his instrument is composed of two semi-circular springs, the front end being fastened by a brass vertical hinge to a small plate of thin steel, which supports the pad. The pressure of the spring keeps the pad closely applied to the umbilical region, while the hinges which unite them to the steel plate impart all the flexibility which is necessary for accommodation to the various motions and attitudes of the body. It appears to us that the elastic belt and air-pad will attain that end in a much more easy and certain manner. Ivory hemispheres, either retained by springs or straps of adhesive plaster, as recommended by Sir A. Cooper, must act too powerfully, and be very troublesome with children; nor can a radical cure be easily obtained, as the vitality of the part is too harshly interfered with; but it has been stated to us that the continuous gentle pressure of the air-pad and elastic belt has, in several instances, brought about, in young subjects, a permanent occlusion of the abnormal umbilical apertures.—*Lancet, July* 12, 1851, *p.* 33.

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91.—*Effects of Morphine in Hernia.*—By EDWARD W. DOMAN, Esq., Essex.—[Mr. Doman relates a case in which a labourer, a native of Suffolk, aged 32, had been the subject of left inguinal hernia for five years. It had frequently come down, but always returned on assuming the recumbent posture. On the 18th, he was attacked with severe purgings; and on the 19th, the hernia descended, but was soon returned; but in the afternoon it again descended, and could not be returned. On the 20th, he was taken home, and at five p.m., Mr. Doman was sent for. He found a direct inguinal hernia of the left side, of considerable size, and filling the scrotum of that side; tense and painful; he had vomited several times, and complained of much pain below the umbilicus. As he was considerably prostrated, he was not bled, but placed in a warm bath, and the taxis applied. Mr. Doman continues:]

After persevering with the taxis for some time, without avail, I had him put to bed, and gave him half a grain of muriate of morphine every hour, until he had taken one grain and a half. He was soon considered narcotized; vomiting had ceased, and pain moderated. I again tried the taxis, without effect. Thinking he would become still more under the influence of morphine, I left him for a short time. The taxis was again tried, but had no effect.

About eight a.m. of the 21st, he had recovered from the effects of morphine; the hernia as tense and as large as at first, and having been in that state upwards of thirty-six hours, I told him that I thought it would be necessary to operate, but I would first try a warm bath and bleeding. I bled him in the bath, *ad deliquium*, and attempted reduction but failed; he was now put into bed, where he became sick, very faint, and covered with profuse perspiration. I again tried to reduce it, but without any effect on the hernia. On his recovering from syncope, I told him it would not be safe to delay operating any longer. It was now ten a.m. He positively refused to allow the operation. He was again in great pain, particularly on handling. I thought if I brought him more completely under the influence of morphine, there might be a chance; and as he still refused to be operated on, I began giving him half-grains of morphine every hour, until he had taken two grains

and a half. About three p.m. he was quite narcotized, and on examining the scrotum I found it more flaccid; and on using the taxis, the hernia in a few moments passed up easily; he was immediately relieved, after having been forty-eight hours in suffering. He slept quietly that night, kept himself quiet all the Friday, his bowels acting that day without medicine; and after fitting himself with a truss (which he had never yet worn), he returned to his work on Monday, the 25th.

In the 'Monthly Journal of Medical Science,' for 1841-2, formerly edited by Dr. Cormack, several cases are given of hernia having been reduced through the influence of opium; and one (Number for July, 1842, page 591), where three grains of solid opium and four and a half grains of morphine were given in the course of a few hours, before reduction could be effected. I have myself, whilst residing in the West Indies, seen several cases reduced by means of opium, and this is the third case that has occurred to me in this village within three years, where morphine has been effectual in hernia, twice in one individual. In the case of J. S., the hernia had been strangulated twenty-four hours before any medical man saw him. Had bleeding any effect in rendering morphine more effectual the second day? Perhaps it had. I should in future, particularly in young and able subjects, always have recourse to bleeding before using morphine.—*Lancet, September* 13, 1851, *p.* 249.

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92.—*On a New and Simple method for the Cure of Fistula.*—By H. B. Evans, Esq., London.—[The frequently unfortunate and unsatisfactory results of the operation for the cure of fistula in ano, suggested the following plan to Mr. Evans:]

In October, 1850, W. E——, box-maker, aged 42, applied to me with an abscess in the neighbourhood of the rectum, pointing externally, which was opened, and gave exit to a large quantity of pus. This gradually degenerated into a deep fistulous tract along the rectum, and communicating with it at its extremity. For two months the usual remedies were adopted without success, and I then expressed my opinion that an operation must be resorted to. In this I was fully borne out by the opinion of an eminent hospital surgeon whom I called in. This the patient obstinately refused to submit to, and such refusal led to my adopting the mode of treatment I am about to detail.

A blunt-pointed silver probe, five inches in length, (the sinus itself being four inches in depth,) was inserted into the wound, having previously being dipped in dilute nitric acid, (one part of acid to one part of water,) and suffered to remain there a minute. That this had a strong cauterizing effect, I knew from the pain it occasioned. Thus far the result was desirable; but in consequence of the destruction of the silver probes by the acid, and the impossibility of using them more than three or four times, I had some copper ones made, and used them in the same manner, only thus substituting a nitrate of copper for a nitrate of silver, and I think with a better effect. Under this treatment I was pleased to see the depth of the sinus daily decrease by the gradual filling of it up with healthy granulations from the bottom. This was continued nearly every day for two months, February 22d, 1851, being the last occasion on which I thought it necessary to apply the nitrate of copper. The patient is at the present time perfectly sound.

In March, 1851, W. H——, aged 30, applied to me with strumous disease of the testicle. Iodine and iron were given, which arrested the progress of the disease, and produced a corresponding improvement in his health. The outward form of the testicle was retained, but with an open sinus of an inch and a half in length in an oblique direction from the apex, and discharging a thin, white, glairy fluid, peculiar to fistulæ. The same treatment was pursued as in the former case, the sinus becoming entirely filled up, and the patient discharged at the commencement of the present month (September), without any external marks of previous disease, beyond a slight irregularity on the surface and a small cicatrix.

Thus by an easy method may the most strumous fistulæ be traced to their extremities, and a strong caustic power applied to the bottom of the wound, from whence it is so desirable granulations should arise.

A limited sphere of private practice enables me only to give these two cases;

but I have no hesitation in saying, that if this system be approved of and practised by surgeons generally, they would have as much reason to be satisfied with it as myself and patients, and the use of the knife would become almost obsolete. When a silver and copper wire are introduced together, after having been dipped in the acid, the caustic effect is intense, (likened by the patient to a red-hot wire,) and if allowed to remain too long, would destroy the tissues with which they were in contact. This, I apprehend, is the effect of the galvanic action set up by the contact of the copper and silver wire with the acid acting upon them.

Before concluding, I will just observe that the treatment in the first case was put into practice some time before the report of the treatment of 'Fistula and Hæmorrhoids by Platinum Wire made red-hot by Galvanic Battery, by Mr. Marshall, of University College Hospital,' published in 'The Lancet' of May 17th, 1851.—*Lancet, October* 11, 1851, *p.* 343.

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## 93.—ON FISTULA IN ANO.

By T. B. Curling, Esq., F.R.S., Surgeon to the London Hospital, &c.

[Mr. Curling makes the following interesting remarks on the utility of the ligature in the treatment of fistula in ano.]

When the opening in the rectum is more than an inch and a half above the external sphincter, the division cannot be make without risk of hemorrhage, which the surgeon may find great difficulty in arresting—indeed, death from bleeding has happened after the division of a rectal fistula high up. These cases are best treated by a ligature, which if properly applied and very gradually tightened, answers very well, and is less tedious and painful than is commonly supposed. The application of the ligature to fistula, though often practised formerly, is now seldom resorted to, the knife being found a less painful and tedious means of curing the disease. Some years ago, my colleague at the London hospital, Mr. Luke, devised an ingenious screw tourniquet for gradually increasing the tension of the ligature, by which an improvement is effected in this mode of treatment. A strong cord of dentist's silk having been carried through the fistula by the introduction of an eyed probe with a moveable extremity, and withdrawn at the anus by means of a spring catch passed into the rectum upon the fore-finger of the operator, is to be attached to the screw apparatus, and secured with moderate tightness, but not so as to cause pain. The tension of the ligature is afterwards to be very gradually increased by turning the screw as it gets loose, until the cord cuts its way out. While this process of ulceration is proceeding, the gap behind becomes filled up by granulations; so that, in a day or two after the removal of the ligature, the fistula is found to be cured. Though the treatment by ligature in this way is safe and nearly free from pain, and admits of the patient moving about, the application of it gives more trouble than division of the parts by the knife; and owing to the necessity for turning the screw at intervals, more attention is required afterwards. On these grounds, incision is preferable in ordinary cases, and I may add, is so regarded by Mr. Luke; but, in cases of fistula opening so high up in the rectum that the knife cannot be used without danger of hemorrhage, I should certainly employ the ligature. Such cases, I know, are not common in practice, but they do occasionally occur. I witnessed the treatment by ligature of two of Mr. Luke's cases, in one of which the internal opening of the fistula was two inches above the anus, and the other as high as the point of the finger could reach; and a patient with a fistula of a similar character to the last was under my care in the hospital last year, but the state of the man's general health prevented my adopting any mode of curing the local disease.—*Brit. and For. Med.-Chirurgical Review, Oct.*, 1851, *p.* 375.

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94.—*On Fistulous Communications between the Rectum and the Vagina.* By T. B. Curling, Esq., F.R.S., &c.—Mr. Copland has the credit of having first practised the division of the external sphincter for the cure of fistulous communications between the rectum and vagina. The proceeding is applicable to another

class of cases, to which I may here briefly allude. The extremity of the septum between the vagina and rectum occasionally becomes lacerated in labour, the patient being afterwards unable to retain her fæces. The cure of this distressing infirmity may be effected by paring the edges of the gap, and, after division of the external sphincter on each side, bringing them together with sutures, which should be tied in the vagina. An opiate afterwards will keep the bowels at rest for two or three days, and the sutures may be taken out on the third day. The operation does not always succeed, but the double division of the sphincter much lessens the chances of failure.—*Brit. and For. Med.-Chirurgical Review, Oct.*, 1851, *p.* 376.

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95.—*On Prolapsus of the Rectum, with Internal Hæmorrhoids.* By T. B. CURLING, Esq., F.R.S., &c.—In slight cases of prolapsus, accompanied with internal hæmorrhoids, in adults, the contraction that takes place after the removal of the piles by ligature, or in other ways, will often counteract the laxity of the parts, and afford sufficient support to prevent a return of the inversion. But if this should not be the case, the tendency to prolapsus may be effectually obviated by an operation which consists in the excision of portions of mucous membrane, and a little of the skin from the margin of the anus. The patient being placed on his back in the position usual in the operation for lithotomy, a fold of membrane, more or less broad according to the laxity of the part, is to be seized with a volsellum, or the curved entropium forceps, raised a little, and then excised with a curved pair of scissors. Two portions, one from each side of the rectum, will generally require removal, leaving two oval wounds in the longitudinal direction. It is desirable that the edges of the wound should be afterwards brought together with sutures, not only to secure the speedy healing of the wound, but as the compression occasioned thereby helps to arrest bleeding. Unless, however, chloroform be used, there is some difficulty in applying them, in consequence of the forcible contraction of the sphincter excited by the operation drawing in and concealing the wounded parts. The surgeon must be careful to tie any bleeding vessel that may be divided, for the operation is very liable to be followed by hemorrhage which may go on into the bowel without his being aware of it. An examination with the speculum should be made before the patient is left. Cases in which this operation is called for are certainly not common. In persons who have suffered from prolapsus in childhood, it sometimes happens that the parts do not recover their tone at puberty, and that the complaint continues to prove troublesome afterwards. Such a case is very fit for excision. In 1835, I assisted my colleague, Mr. Luke, in performing this operation upon a lad in the London Hospital. He was nineteen years of age, and had been troubled with prolapsus ever since he was three years old. The bowel always descended several inches when he went to stool, and was a source of great annoyance to him. Two oval portions of mucous membrane were excised from the verge of the anus in the way above described. The sphincter immediately afterwards contracted strongly, and completely buried the wounded surfaces. There was no reason at the time of the operation to expect any bleeding; but on visiting the lad in the evening, for Mr. Luke, I was surprised to find him in a state of prostration, with a cold, clammy skin, and shivering. It appeared that on two or three occasions he had discharged a considerable quantity of blood, which had collected within the rectum. Having given him some brandy, I introduced a thick plug of lint, previously oiled, which was effected with some difficulty, owing to a strong spasm of the sphincter. There was no recurrence of hemorrhage, and the two wounds healed up in the course of a month. The operation was quite successful in preventing further prolapsus. If another case of hemorrhage from vessels at the lower part of the rectum occurred to me, I should insert a good-sized piece of sponge, which expanding as it became moist, would more effectually plug the part.—*Brit. and For. Med.-Chirurgical Review, Oct.*, 1851, *p.* 374.

## 96.—CASE OF PROLAPSUS OF THE RECTUM IN THE ADULT.

Under the care of Mr. Fergusson, King's College Hospital.

[Prolapsus of the rectum occurring in infants is a comparatively common disease, especially where there exists much laxity of the bowels and crying. The same effect will be produced by the existence of stone in the bladder, but will be removed on the removal of the stone. In other cases it is of slight importance, though, occurring among the uncleanly and negligent poor, very distressing cases are met with. In the adult it is of rare occurrence.]

When this affection attacks an adult, it is very frequently connected with the existence of internal hæmorrhoids, and the more these increase in size, uncontrolled and unarrested, the more is protrusion of the lower bowel likely to occur. When the piles are removed by the ligature, prolapsus will not take place; and the disease may, by the contraction produced by the ligatures, be completely cured, if already existing. In cases, however, where such a state of things has been neglected, matters may assume such a character as to necessitate an operation; and as the latter is but seldom performed, we shall just give a short sketch of a case of prolapsus, where Mr. Fergusson had recourse to the method generally recommended:—

Francis R——, aged thirty-eight years, of a fair complexion, nervous temperament, and who has led a very irregular life, had generally enjoyed good health, when, about seventeen years ago, he began to be troubled with hemorrhoids. About twelve years since, the patient first noticed that after much walking or straining at stool, a slight prolapse of the rectum would take place; but it is only within the last seven years that he has been severely inconvenienced by such protrusions. The patient first applied to Mr. Bowman, who advised an immediate operation, but a great deal of unnecessary delay took place on account of the man's hesitation, and he was finally admitted under the care of Mr. Fergusson, June 1st, 1851.

On examination, much loose skin was found around the margins of the anus, and upon the patient straining, the bowel protruded to a considerable extent, the mass presented a bluish and nodulated appearance from strangulation at the anus. Mr. Fergusson determined upon the excision of a great portion of skin around the anal orifice, with the hope that the contraction produced by cicatrization would greatly assist in keeping up the bowel; the patient was therefore brought into the theatre, June 7, 1851.

When he had been completely narcotised with chloroform, the rectum prolapsed to a fearful extent, the sphincter being completely relaxed by the general anæsthesia. The protruded parts were about the size of a man's fist, glistening, irregularly globular, bluish-red from congestion and a sort of strangulation at the anus, and retained by loose folds of skin. Mr. Fergusson now proceeded to take up portions of the redundant skin with the volsellum, and cut off with the scissors five triangular pieces of skin, the base towards the anal orifice. The bowel was then returned, the parts well supported, and dressed with wet lint.

Mr. Fergusson stated that before the operation the sphincter could not act, from the great amount of loose skin around the anus; and that now there was much likelihood that cicatrization would produce a sufficient amount of contraction for the bowel to gain much support. He had performed the operation before with complete success; the radii of a circle produced by it around the anus, rendered that orifice smaller, and enabled it to guard against prolapse. It was, however, doubtful whether in the present case he had taken off a sufficient quantity of skin.

The patient progressed very favourably, though he experienced some pain; his bowels were gently kept open by emollient enemata, and in the space of about twelve days the orifice of the anus was much contracted, though some redundant skin was still existing in that locality. The improvement was steadily maintained, the bowel remained *in situ*, and the cure might have been perfected by the removal of some more skin, when the patient, who is of an eccentric disposition, left the hospital of his own accord.

Mr. Curling observes that this disease, when it affects adults, is more common in women than men. Child-bearing has of course much influence here. With

men, however, "prolapsus of the rectum may be combined with internal piles, and such subjects are sometimes affected with enlargement of the prostate gland or stricture, and are accustomed to strain on passing water. This frequent forcing, as well as the habitual protrusion of the hæmorrhoidal folds, so weaken the sphincter, and relax the coats and connexions of the rectum, as ultimately to cause displacement and inversion of the bowel."

Mr. Curling mentions a case, under the care of Mr. Luke, in 1835, in which the same operation, as described above, was performed with very satisfactory results. The patient was nineteen years of age, and had been troubled with prolapsus ever since he was three years old. Two oval portions of mucous membrane were excised from the verge of the anus; the sphincter immediately afterwards contracted strongly, and completely buried the wounded surfaces. There was some unexpected hemorrhage in the evening, but the operation was quite successful in preventing further prolapsus.—*Lancet, October* 4, 1851, *p.* 311.

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97.—*On Irritable Ulcer of the Rectum.*—By T. B. Curling, Esq., F.R.S., &c. In the treatment of irritable ulcer, Mr. Curling naturally places his chief reliance on incision through the centre of the ulcer, with simultaneous division of the sphincter. He speaks highly of the use of an ointment containing chloroform, as an application to sensitive ulcers. His formula is as follows:—℞. Chloroformyl, 3 j-ij; zinci oxydi, 3 ss; olei olivæ, 3 j; cerati cetacei, 3 iv. M. fiat unguentum.—*Brit. and For. Medico-Chirurg. Review, Oetober*, 1851, *p.* 372.

[The Editor of the 'Dublin Quarterly Journal,' commenting on Mr. Curling's views, says,]

We agree with the author as to the ordinary seat of this ulcer, and we also agree with him as to the intensity of suffering of the subject of it. Yet we have met with cases where not a particle of suffering existed, and where rather curiosity than otherwise led to its detection in obstinate dysenteric diarrhœa, the cure of the latter rapidly following the attention paid to the former. Ulcer of the rectum is almost always within reach of the finger, and either wholly or partially within sight by divaricating the anal aperture or by using a polished gorget speculum or rack-dilating speculum,—much on the principle of the instrument for the vagina. The ulcer is often single, and, as our author states, curable by local means. In addition to the remedies mentioned by him, we may add to the list the salts of copper, particularly the nitrate and the sulphate. The former we have applied with very beneficial results, and we think them less painful than others in ordinary use. Ointments may in some instances succeed, and Mr. Curling mentions that he employed with good effect one containing chloroform, in the proportion of from one to two drachms to half an ounce of cerate. In cases in which we are obliged to operate with the knife we prefer the convex-bladed scalpel, as recommended by the late Professor Colles. Ulcers of the rectum are not free from occasional constitutional complication, such as struma or syphilis, and when so they demand special treatment. It must also be borne in mind that more serious lesions may coexist, which should render our prognosis cautious; thus, we recollect a case where rapid and fatal peritonitis, from perforation of an ulcerated patch of the ileum near its termination, supervened, and where the prominent features of the case were an ulcerated fissure implicating the anus and the adjoining portion of the rectum. The man, the subject of it, had been worn out and emaciated by the agony of the affection, and was admitted into hospital for its treatment on a Saturday; on the following Tuesday he was suddenly attacked, as above stated, and in twenty-four hours was dead. The only traceable lesion in the rectum was the ulcer, and an hypertrophied condition of its lining membrane.—*Dublin Quarterly Journal of Med. Science, November*, 1851, *p.* 451.

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## 98.—ULCER IN THE RECTUM.

By Henry Smith, Esq., Surgeon to the Westminster General Dispensary.

[Mr. Smith was requested to see a respectable married woman, 30 years of age,

complaining of excessive pain at the lower part of the rectum, and of great agony whenever the bowels were moved. Some months before she had contracted a discharge from her husband, of which she had ultimately been cured. There was a discharge of purulent matter from the gut. Local treatment had been tried, but with no relief. Mr. Smith says:]

On examination I found a small ulcerated fissure running up into the rectum from the right side of the anus, and, on passing the finger into the gut, a rough surface was felt, involving a third of its circumference, and extending upwards about an inch. The introduction of the finger produced horrible pain. I ordered the patient to go to bed, and to take a dose of castor oil, to get the bowels unloaded; and on the following day, I passed my left fore-finger into the rectum, carried a sharp pointed bistoury along it to the distance of an inch, and cut well through the lining membrane of the gut, and such of the fibres of the sphincter as enabled me to pass the finger again with scarcely any resistance. The incision was made opposite to that side which was ulcerated; a small pledget of lint, dipped in oil, was introduced, and a dose of laudanum given.

The relief from this slight operation was extraordinary; from that time she had no more pain, not even when her bowels were moved, and she was only kept to the house two or three days; the ulcer rapidly healed, and instead of suffering a life of misery, this woman became freed from her sad complaint, and restored to health.

There are few affections which produce more suffering than slight fissures of the anus or ulcerations of the rectum; they are not commonly found in persons above a certain sphere in life; but in hospital and dispensary practice we meet with them not unfrequently, especially among persons who have suffered from some venereal affection—women chiefly. They are very frequently overlooked if the patient makes any complaint; and if the surgeon be not careful, and neglects the examination of the rectum by the finger, the origin of the suffering will not be assigned to the true cause, and, in all probability, lotions and ointments will be used in vain to the external parts for weeks and months. Sometimes only a slight fissure can be perceived to account for the patient's sufferings; but, in the majority of cases where a previous gonorrhœa has existed, this fissure will be seen running upwards to a more or less extensively ulcerated surface, and, on introducing the finger, that peculiar roughness at one spot is felt by the surgeon, which cannot be mistaken, and the dreadful pain experienced by the patient, which, combined, to a certainty indicate the disease.

It is almost useless to lose time, and put the patient to constant pain, by employing local applications; the best plan of effectually and speedily curing the affection, is to adopt that which the ordinary principles of surgery teach us with reference to ulcerations on other parts of the body, more especially those situated in parts exposed to constant or periodical motion, and this is, to keep them in a state of quietude. The mode of cure consists in making an incision, more or less deep, through the coats of the rectum, so as to remove, or rather prevent, the spasmodic contraction of the gut; if the ulcer is extensive, it will be well to divide the sphincter completely, but in some instances it will be sufficient to divide the mucous membrane fairly, and only some of the fibres of the sphincter. The proceeding is very simple, little blood is lost, and both patient and surgeon will be amply repaid by the great relief which is at once given, if the operation be properly performed That ingenious and talented practitioner, both in medicine and surgery, Dr. James Arnott, has informed me, that a very successful remedy, in fissure of the anus, consists in passing a bougie made of yellow soap up the rectum, from time to time. I have not yet tried this plan, but shall certainly do so, on that gentleman's recommendation, in any case where the simple operation above spoken of will not be assented to.—*Med. Times, Sept.* 6, 1851, *p.* 255.

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99.—*On the Morbid Anatomy of Chronic Ulceration of the Rectum.* By T. B. CURLING, Esq., F.R.S.—My inquiries into the morbid anatomy of the rectum have led me to remark the frequency of ulceration of its mucous lining, not only in cases of dysentery, and as a consequence of the ordinary disease of the part, such

as stricture and cancer, but as a separate affection. In several specimens which I have examined, ulceration was diffused over a considerable extent of surface. I have observed the whole of the lower part of the rectum stripped of its mucous membrane for a distance of two or three inches. This extensive disease is sometimes, indeed generally, attended with thickening and consolidation of the subjacent tissues, without diminution in the calibre of the bowel. The muscular coat is in some instances hypertrophied. In one case, the mucous coat for a short distance within the sphincter was so riddled with holes as to form, as it is described in the post-mortem book, "a perfect cribriform tissue," the submucous tissues being at the same time much thickened. I have seen the mucous membrane ulcerated in patches, the sound portions being in some places detached from the muscular fibres beneath, so as to form bridges more or less broad, or merely some narrow bands or bridles. There were frequently abscesses and fistulous passages in the thickened tissues around the diseased rectum. In two instances ulceration had produced a perforated opening communicating with the peritoneum, death having been caused by the escape of some feculent matter into the abdomen and inflammation of the serous membrane. In other cases the peritoneum was involved in the consolidation, and inflamed without being perforated, the omentum in one case being adherent to the anterior part of the rectum.—*Brit. and For. Med. Chirurgical Review, October*, 1851, *p.* 376.

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## 100.—ON HÆMORRHOIDS.

By T. B. Curling, Esq., F.R.S., Surgeon to the London Hospital.

[The following observations by Mr. Curling, on account of their practical usefulness, are exceedingly valuable.]

Internal piles, when of such a size as to protrude at the anus, or when subject to inflammation, ulceration, and bleeding, so as to prove a constant source of annoyance and suffering, must be removed by operation. This may be done by excision. by cauterisation, or by ligature. Excision is the quickest and least painful of these proceedings; but there have been so many instances in which dangerous hemorrhage has occurred after the removal of internal piles with the knife, that few good surgeons now advocate the operation, or venture to perform it. Several eminent operators who have tried excision have acknowledged that they have been obliged to abandon the practice, in consequence of the serious risks which some of their patients incurred from bleeding. Dupuytren, who was an advocate for excising piles, used frequently to have recourse to the actual cautery to arrest the hemorrhage which ensued; and it is well known that Sir Astley Cooper had some fatal cases in consequence of bleeding after this operation.

Mr. Colles, of Dublin, was in the habit of transfixing the base of the tumours with a hook before excising them, to prevent their being drawn up within the sphincter, which enabled him to command a view of the parts, in the event of any vessel requiring to be tied. This mode of securing the parts affords some advantage to the operator; but it often happens in this operation, that, although the bleeding may be comparatively slight at the time the piles are cut off, a large quantity of blood escapes in the course of a few hours afterwards, and gradually accumulates in the rectum. Dieffenbach's plan is preferable to the preceding. He first passed a ligature through the base, and grasping the pile with the forceps, excised it between the forceps and the ligature, which was then tied. The pressure produced by bringing the edges together assists in preventing hemorrhage. Small elongated piles can be removed in this way without risk.

Internal piles admit of removal by cauterization. Dr. Houston, of Dublin, in a paper published in 1843, strongly recommended the use of nitric acid for the cure of the florid vascular pile; and I have since employed this escharotic in cases of the kind. It has the advantage of being a safe and mild remedy, and is certainly well adapted for destroying the bright fungous looking pile which is often the source of hemorrhage, and the cause of much local uneasiness. Means having been taken to bring the pile well into view, the patient should lean over a table, and his nates should be separated by the hands of an assistant. The surgeon may then

take a glass pen, such as is now common in the shops, with rather a large aperture at the point, and, having dipped it in concentrated nitric acid, so as to load the bulb of the pen, may apply the escharotic to the entire surface of the hæmorrhoid, until its florid hue becomes quite changed to an ash colour. No speck of red should be allowed to remain. Care must be taken that none of the acid touches the skin at the margin of the anus. The moisture on the surface having been absorbed with lint, and the part smeared with sweet oil, the protrusion may be replaced within the sphincter. The pain consequent on the application is not severe, and the separation of the superficial slough and healing of the sore occasioned by the acid are attended with scarcely any uneasiness. If the pile be not large, this plan answers very well, but it is not sufficient for the removal of hæmorrhoidal flaps and tumours of any great size.

For the cure of internal hæmorrhoids of any considerable size, the ligature is the safest and most effectual remedy. In order to apply the ligatures properly, it is necessary to promote the protrusion of the piles. For this purpose, a dose of castor oil should be given about six or eight hours before the time fixed for the operation; and a pint of warm water should be thrown into the rectum shortly before the surgeon's arrival. When the fluid is discharged, the piles will descend. The application of the ligature being a somewhat painful proceeding, chloroform may be given if the patient desire it. The operation should then be performed, the patient lying on the side with the thighs raised: otherwise the most convenient position is with the body leaning over a table, and the nates separated by an assistant. The growth to be tied should be seized with the volsellum, and drawn out. If the pile be an elongated one, a ligature may be tied tightly round its base. In other cases a curved needle set in a handle, with the eye near the point, and armed with a strong silk ligature, should be passed through the base of the pile from without inwards. The needle is then to be withdrawn, the ligature being left double. The loop being divided, the pile is to be strangulated by drawing the ligatures close round the base, and knotting them as tightly as possible on each side. The other piles are afterwards to be treated in the same way. When the hæmorrhoids are large in size, a notch made with scissors on each side at the part to be girt with the ligature, just before it is tightened, will facilitate the separation without any risk of bleeding. The ends of the ligatures having been cut short, the strangulated piles should be gently pushed up into the rectum. If the operation have been performed without chloroform, a strong opiate may be given at its conclusion. Any swelling and heat about the anus that may afterwards arise, must be relieved by poultices and fomentations. No aperient should be given for several days. The tighter the ligatures are tied, the sooner they ulcerate through and come away. They generally separate in about four or five days, during which period the patient should remain in bed or on the sofa. The detachment of the sloughs leaves, of course, at the lower part of the rectum a sore surface, which bleeds slightly when the bowels are relieved, and some attention will be required until this heals. The motions must be kept soft by mild aperient medicine—as the lenitive electuary, or castor oil. If the sore be slow in healing, it may be smeared night and morning with a liniment consisting of a drachm of the *liquor plumbi diacetatis* and an ounce of the confection of roses; or it may be brushed over with a weak solution of the nitrate of silver.—*Brit. and For. Medico-Chirurg. Review, October*, 1851, *p.* 373.

[In another review of Mr. Curling's work, in 'The Dublin Quarterly Journal,' we have some additional and valuable remarks on this subject. The Editor says:]

Both as regards internal piles and the common external hæmorrhoid, much is yet to be learned, and hence, perhaps, surgeons cannot boast as to their perfectly successful management. As regards the former, we have tried every description of caustic in their treatment: the mineral acids,—particularly the nitric, strong acetic acid, the acetum cantharidis, the tincture of the sesqui-chloride of iron, the potassa fusa, and various powders,—amongst others, with probably the best effect, equal parts of the red oxide of mercury and burnt alum, but we must say that the result has rarely been a cure, unless the size and character of the hæmorrhoid favoured such treatment. Of all now named, the potassa fusa, or the potassa cum calce, is the most penetrating, but its action cannot be safely limited, and

much pain attends its use. We have, however, most frequently applied the nitric acid; in some instances, as stated in the essay of the late Dr. Houston, and as confirmed by Mr. Curling, its application is almost painless, whilst in others we have seen it followed by most extreme agony, and by a train of constitutional symptoms by no means free from uneasiness to the practitioner, the nervous system being particularly implicated. We prefer for this application of the acid, small flattened pieces of wood, not too brittle, but yet thin, and shaped like a miniature boat-oar. It appears to us to be preferable to the glass pen recommended by the author; with it the acid can be well *soddened* into the tumour, and there is no risk of an overflow, which we have seen happen more than once with the pen. But, according to Mr. Curling, "for the cure of internal hæmorrhoids of any considerable size, the ligature is the safest and most effectual remedy." Having given full directions for the mode of its application, in which we do not find anything to detain us, he says:—

"The extirpation of hæmorrhoids by ligature is both an effectual and a safe mode of treatment, and the use of chloroform removes almost entirely the pain attending it. Those adverse to the plan have magnified the risks and sufferings, and have spoken of phlebitis, and tetanus, and diffuse inflammation followed by sloughing, as common occurrences after the operation. No fatal case has come under my own notice, either in public or private practice. Some amount of danger must be incurred in every kind of operation, serious results sometimes arising from the slightest causes; and the tying of piles cannot be expected to be exempt from risks which may attend a trifling puncture in the finger. But an unfortunate result from the application of ligatures to piles is entirely exceptional; and with common precautions this proceeding must be regarded as safe as any operation in surgery."

Such view of our author is confirmatory of that of Sir Benjamin Brodie, as regards the treatment of hæmorrhoids by ligature, but is altogether opposed to that of the Dublin school. In a few cases of internal hæmorrhoids we adopted an expedient similar to that used in the treatment of ordinary nævi, and it appeared to answer extremely well; namely, passing through the tumour worsted cross threads, and loosely knotting them, and as the necessity arose, in the process of solidification, saturating these threads with sulphate of copper or nitrate of silver lotion: unquestionably the irritation produced was very tolerant and trifling.

We have now adopted, and with benefit, Sir Benjamin Brodie's plan of treating erectile tumours, namely, of puncturing with a small, narrow knife one of these hæmorrhoids, immediately passing in a fine probe, armed with fused nitrate of silver, freely moving this about, and even leaving the small portion of caustic behind.

Of all the modes of treatment, however, we are most favourable to the actual cautery; we do not mean to assert that it is always successful, but we do believe it is more so than any other plan, and the idea of it is the worst feature connected with it. Mr. Cusack has, we think, an excellent contrivance for this purpose. It consists of a strong forceps, with flattened or spoon-shaped blades, having small holes for the passage of threads to secure a piece of chamois leather, which at the time of use is well damped with cold water, and which is of course shaped so as to cover the adjoining parts; with this flattened forceps the particular tumour is seized and secured, and then the iron, heated to a white heat, and shaped according to the size and form of the hæmorrhoid, is steadily and firmly applied. One, two, or three, may be so treated in succession. In this step of the proceeding a certain amount of adroitness is requisite, so as to limit the action of the cautery, and immediately after the object is attained successive applications of iced or the coldest water should be employed. We have met with cases both in males and in females where this mode of treatment absolutely gave less pain and more substantial relief than any others above named or described by the author.—*Dublin Quarterly Journal of Med. Science, November*, 1851, *p.* 452.

### 101.—PHAGEDÆNA OF TONGUE, GUMS, AND LIPS—RAPID RECOVERY.

Sarah H—, æt. 6, a strumous child of low powers, living in an unhealthy neighbourhood, near Newington Causeway. Was admitted as an out-patient on July 18th, with acute phagedænic ulceration of the side of the tongue, gums, and lips; it was of one week's duration, and was now spreading rapidly.

Caustic was freely applied. Ten grains of chlorate of potash in water to be given three times a day; and the sore to be sponged frequently in the course of the day with a solution of nitrate of silver, (three grains to the ounce.)

In a few days the phagedænic action was checked; and at the end of a fortnight, healthy granulations were seen fast repairing the breach. Bark and soda were now substituted. On August 8th, the child was perfectly cured.

*Phagedænic Ulceration of Gums and Lips—Cure.*—Mary C—, æt. 3½, living in Bermondsey, was brought to the surgery on March 8th, with phagedænic ulceration of the gums and inner part of the lip. She had been ailing for nearly one week, but the ulceration commenced four days back, and was now extending very fast.

Nitrate of silver freely applied. Ten grains of chlorate of potash in water three times daily. A solution of caustic (3 grains to the ℥j) to be used frequently; and a saline purge occasionally.

March 20th.—Quite well.

*Phagedænic Ulceration of Groin, &c.—Recovery.*—Elizabeth C—, æt. 3, a thin, spare child, living at Hackney, in a healthy neighbourhood; became an out-patient on January 24th, having extensive sloughing phagedænic ulceration of the bend of the thigh on the right side, which was of eight days' duration. She was also afflicted with worms.

Ordered a stale-beer grounds poultice; ten grains of calomel and scammony powder immediately; also twelve grains of chlorate of potash in water three times a day; and to have some meat and porter daily.

On the 26th, a great many ascarides had been expelled; the sore had improved in appearance, and the sloughs were separating.

Jan. 31st.—The phagedænic action was entirely checked, and the health much improved. To continue the medicine, and to have another dose of the powder; nitric acid lotion applied to the sore.

Feb. 21st.—Child presented perfectly well.

*Phagedænic Ulceration of Labia and Bend of Thigh—Recovery.*—Jane J—, æt. 20 months, a stout, healthy-looking child, brought up by hand; living in the Kent road, in a tolerably healthy part. Had been ailing one week, was brought to the surgery with extensive, spreading, superficial ulceration of both labia and bend of the thigh on the right side, almost running into gangrene. This was accompanied with great œdema, and excessive pain and difficulty in micturition.

Ordered stale-beer grounds poultice; nutritious diet; and ten grains of chlorate of potash in barley-water three times a day.

This treatment was pursued with speedy success, subduing the phagedænic tendency, and causing a healthy action to be set up in the ulcerating surface. In a few days, a simple bread cataplasm was substituted; and at the end of three weeks the child was quite cured.

The above four cases fully prove the value of nitrate of silver in solution and stale-beer grounds as applications in phagedænic action; at the same time the effects of chlorate of potash must not be forgotten as an important agent in checking acute ulcerative spreading.—*Guy's Hospital Reports, Vol.* vii., 1851, *p.* 331.

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## URINARY ORGANS.

### 102.—ON THE TREATMENT OF STRICTURE BY EXTERNAL INCISION.

By Professor Syme, Edinburgh.

Strictures of the urethra may be divided into three classes. First, those in which there is no real organic contraction of the canal; second, those in which the contraction admits of dilatation, and may be prevented from returning by the use

of bougies; and thirdly, those which either resist attempts to effect dilatation, or return so quickly after its completion as to prevent any permanent advantage from being derived by the patient.

The first class is very numerous, in consequence of the various and frequent circumstances which, independently of contraction, tend to impede the flow of urine. Hæmorrhoidal affections and fissure of the anus, enlargement of the prostate, paralytic states of the bladder, disorder of the digestive organs, sexual excesses, and an irritable state of the urethra, with many other derangements of a functional and organic kind that might be mentioned, are apt to occasion, more or less, uneasiness in micturition, and excite the suspicion of stricture. The introduction of a full-sized bougie would of course correct any such erroneous impression, but, unfortunately, cannot always be accomplished, even though there is no obstruction, through want of practice in the use of instruments, and morbid sensibility on the part of the patient. Both he and the practitioner are thus apt to be confirmed in their mistake, and led to enter upon a course of treatment not only altogether unnecessary, but frequently very injurious. It is in these imaginary strictures that various means of remedy have acquired any credit they possess, such as, of course, all those employed externally, or through the medium of the system; and also many others of a local kind, which could not be mentioned on the present occasion without giving offence to their respective authors or advocates, and therefore may be passed over in silence, since they never can be of any practical utility *to the patient*. At the same time, I think it right to protest openly and distinctly against any evidence drawn from this spurious source, being admitted into the discussion of what may be done with most advantage for the treatment of real organic stricture.

The dilatable form of this disease may be remedied in many different ways, through the use of bougies and catheters, flexible or rigid, and introduced occasionally, or retained permanently during the period of treatment. While it cannot be denied that the object in view may be attained by any of these modes, there is as little doubt that they cannot be all equally beneficial, or free from inconvenience; and when they are compared together, with regard to their qualities in these respects, I think there should be no hesitation in giving a decided preference to the metallic bougies, employed at intervals of from two to four days, and withdrawn each time immediately after being introduced. This method, which has been characterised by one of the London writers as "*frivolous*," affords the certain means of dilating any dilatable stricture in the course of a few weeks, not only more easily and safely than any of the other forms in which pressure is employed to widen contractions of the urethra, but also with a greater degree of lasting effect, since it appears that the more slowly the process of dilatation is accomplished, the less rapid is subsequent relapse.

The third sort of stricture fortunately bears a small proportion in frequency to the one last mentioned, but does not do so to the same extent at all parts of the urethra. It is between two and three inches from the orifice, and just before the bulb, that organic contractions are frequently met with. Tight strictures are much more frequent in the latter than the former of these situations, but when they do occur in the anterior part of the canal, are more apt to prove obstinate than those of the posterior position. Thus, of twelve tight strictures, the proportion may be about three in the anterior and nine in the posterior situation, and in each of them *one* of the obstinate kind. I happen to have in my possession a letter from the late Mr. John Pearson, of London, to the late Dr. John Thomson, of Edinburgh, which affords a remarkable illustration of this pathological fact in the following extract:—"London, September 26, 1804,—I have lately had under my care a case of impermeable stricture, about two inches from the meatus urinae. Being foiled in every attempt to open it, I dissected down to it, cut through the contracted part, which was as hard as cartilage, and the wound is now very nearly healed. The patient makes water in a perfectly good stream. I yesterday saw a similar case, and intend to operate on it on Thursday."

In this obstinate form of stricture, there is not only contraction of the canal, but also a remarkable thickening of the part affected, which consequently is in general distinctly perceptible through the integuments, being felt like a ring of firm consistence, and flattened form. The bougie when introduced is firmly

grasped, so as to be withdrawn with difficulty, and the patient, so far from experiencing relief afterwards, usually suffers an aggravation of his distress. It is difficult to account for these differences from the cases of ordinary occurrence, or to explain the origin of a disease so peculiar in its characters. I have not been able to trace any connexion between the effect in question, and the cause giving rise to it, or to distinguish any speciality of constitution favouring its production. But that there may be some predisposition depending upon the temperament, or other circumstances of individual limitation, would appear from the hereditary and collateral connexion occasionally observed between patients thus affected. A gentleman who was lately under my care for stricture of twenty-four years' standing, told me that both his father and grandfather had died of the disease. And some time ago I divided the stricture of a patient who was one of five brothers, three of whom had died of the disease; a fourth, who is now well, had been under my care; and this, the fifth, had run an extraordinary gauntlet of treatment, of which it may be sufficient to mention a year or two passed under the care of Mr. Guthrie, who employed a succession of catheters, and afterwards caustics; a prolonged residence at Gräffenberg, under the water-cure; and a trial of Parisian homœopathy, which nearly proved fatal in a negative way, by disregarding an extravasation of urine that took place, all through the scrotum, and over the lower part of the abdomen, and but for the skilful care of M. Cloquet would doubtless have proved fatal. It is a fact of much practical importance that there is seldom, if ever, more than one contraction of the unyielding or resilient kind in the same urethra.

Having frequently had occasion to witness the distress resulting from this form of stricture, and to regret the insufficiency of any known means of remedy, I had great pleasure in communicating to the profession a safe, easy, and effectual method of overcoming the difficulty, which consisted in dividing the contracted part of the canal upon a grooved director passed through it. The speedy and complete relief thus afforded, even in cases of the most protracted and aggravated suffering, is one of the most gratifying services that can be rendered by the art of surgery. The favourable anticipation originally entertained of it has been more than realized; and any patient who continues to suffer from obstinate stricture, can no longer attribute his wretched state to the imperfection of surgery. In the present and following papers I propose to illustrate and confirm the statements which have hitherto been offered in favour of this treatment.

I have represented it as secure against the ordinary dangers which attend operations on the urinary organs,—namely, hemorrhage, inflammation, and infiltration of urine; and may now appeal to the evidence of forty-four cases which I have thus treated without encountering any of these effects, even in a single instance. It is quite true that through awkwardness, or defective acquaintance with the parts concerned, the artery of the bulb may be cut, and other errors of a serious nature be committed, so that I am not prepared to deny the allegation of this procedure being attended with danger in "inexperienced hands." But any man of ordinary skill, who chooses to follow the directions which I have given for conducting the process, will find little difficulty in accomplishing it. And here I may remark, that my commentators who speak of "long incisions" in the perineum, and laying open the urethra to the extent of several inches, have no warrant for such statements in anything that I have said or written on the subject. I never open the urethra beyond the extent of an inch, and seldom beyond that of half, or two-thirds of an inch.

The bleeding at the time of the operation hardly ever exceeds one or two teaspoonfuls; but occasionally takes place some hours afterwards, to the amount of an ounce or two, being apparently proportioned to the hemorrhagic disposition of the patient, and therefore to be deemed rather salutary than otherwise. If any circumstance should render it desirable to prevent the chance of this discharge, a piece of lint put into the wound at the time of its infliction will effectually do so.

As to the question of "impermeability," I simply maintain, that if the urine passes out, instruments may always, through care and perseverance, be got in beyond the contraction. It should be observed that the case here is quite different from that of a distended bladder requiring *immediate* relief. I have never main-

tained that in such circumstances the introduction of a catheter was always practicable; and although in the course of two-and-twenty years of hospital practice I have not happened to meet with a stricture that resisted this instrument, I neither profess security of being equally fortunate for the future, nor teach such confidence to others, especially if they are not to be daily practised in overcoming obstructions of the urethra. In my 'Principles of Surgery' it is said:—"If the surgeon possesses the requisite tact for introducing instruments into the bladder through the urethra, and has the treatment of the case from its commencement, he will very rarely, perhaps never, be under the necessity of resorting to this puncture. But should he not be able to draw off the water by the catheter, either from his own want of dexterity, or from the existence of obstacles arising from mismanagement or previous organic alteration of the passage, as stricture or enlargement of the prostate, complicated with a lacerated, softened, swelled, and bleeding state of the lining membrane, caused by forcible attempts to pass an instrument, there can be no hesitation in having recourse to the operation. Puncture of the bladder, however performed, is always attended with more or less danger of urinous infiltration; but a doubtful remedy is better than none; and there are few states of disease more hopeless than complete retention of urine, permitted to follow its own course."

But if sufficient time and opportunity be afforded, I firmly believe that every stricture may be rendered permeable. I feel deeply impressed with the importance of this principle, and with the view of establishing it,—not, certainly, to obtain an advantage over my professional brethren,—I have again and again offered to undertake the treatment of any stricture, however impermeable it might be deemed, that was sent to the hospital. All those hitherto received have been afforded complete relief, either by simple dilatation, or by incision after being rendered permeable; and I venture to hope that the results in future will be no less satisfactory.

With regard to the permanence of effect obtained through incision, in my earlier communications I could only express the expectations which seemed to have a reasonable foundation; but now, with the advantage of seven years' experience, I am able to speak more decidedly on the subject. It is well known that cuts, lacerations, and even slight bruises of the urethra from external violence, are almost sure to occasion stricture of the canal, unless a full-sized instrument be passed occasionally for a few weeks after the injury has been sustained; and I have, therefore, always considered attention to this circumstance essential for success. The first three cases of stricture at the bulb in which division was effected, after being treated in this way, seemed so completely divested of their contractile tendency that I expected that it would never be necessary to use any precautionary measures by introducing bougies beyond the period just mentioned, immediately subsequent to the operation. In many patients this expectation has been fully realised, but in others it has been found necessary to introduce bougies for a longer time. How far these exceptions may depend upon some imperfection in the performance of the operation, the mode of healing in the wound, irritability of the system, or impropriety in the patient's mode of life, it is not very easy to determine at present, although more definite ideas may probably be acquired from more extended observation. In the meanwhile I feel warranted to state, that if the stricture be thoroughly divided, and a full-sized bougie be passed occasionally for a month or six weeks afterwards, the patient will certainly obtain complete relief from all the distress which attends the obstinate form of the disease, and require at most merely the precautionary treatment which is found sufficient to prevent the ordinary form of stricture from being troublesome. In illustration of what has been stated, I will now commence a relation of facts, which shall be continued so long as such information seems to be required by the profession.

*Immediate Effects of the Operation.*—As it has been alleged, and perhaps believed, though I should hope by few, that, in order to recommend the treatment of stricture by external incision, I have glossed over the unpleasant consequences of this procedure, and made it appear less formidable than the reality, I hope the following evidence will satisfy every reader who entertains any doubt upon this part of the subject, that I have not underrated the effects of the operation. To show that I do not resort to division of strictures unnecessarily, as had also been insinuated,

or until dilatation is found altogether unavailing for the patient's relief, I stated in the last Number of this Journal the leading particulars of all the cases which had been subjected by me to operation in the Royal Infirmary, during the winter session just concluded. They amount to seven in number, and together with an eighth which has since occurred, were treated publicly in the hospital. All the operations were performed in the theatre before the most numerous class of surgical clinical students in her Majesty's dominions, who can testify that the object in view was always attained without delay or difficulty, and that in no instance did the bleeding exceed in amount a teaspoonful.—*Monthly Journal of Med. Science, June*, 1851, *p.* 534.

[The following is another case brought forward by Mr. Syme in illustration of his treatment. Symptoms of stricture were first detected, in a midshipman, in 1829, but no instrument could be passed; bleeding and hot baths being resorted to. This state continued until 1836, though, during the time, he states his having suffered comparatively little, except having to make water by drops. At this time a severe attack came on, and his sufferings were extreme; but nothing larger than a No. 4 catheter could be introduced. In 1839, his sufferings were so great that he was obliged to leave an expedition upon which he was engaged. Having returned to England, he placed himself under the care of Mr. Guthrie, who succeeded in passing a No. 6 catheter, but no larger, and in a month after the passage was as small as ever. Mr. Syme states:]

In commencing the treatment of this case, I found little difficulty in passing bougies from the smallest size up to No. 5, but then encountered a resistance which, instead of yielding to dilatation, was increased by every attempt to accomplish it, with aggravation of all the symptoms. Under these circumstances, and considering the patient's history, I recommended division of the stricture, and performed it in the usual manner. The operation was completed without the slightest difficulty or delay, with hardly any pain, and with no bleeding. There was no uneasiness or disturbance afterwards, so as even to interfere with reading to make the time pass. At the end of forty-eight hours I removed the catheter, and left the patient apparently quite well. In the evening I was sent for, on account of his being suddenly seized with vomiting and violent shivering, soon after making water for the first time. To any one inexperienced in the operation, the case would then have assumed a grave aspect, and suggested the suspicion of urinary infiltration; but as attacks of the same kind, though seldom so severe, were familiar to me as nervous symptoms attendant upon the urine resuming its natural channel, just as frequently happens after the operation of lithotomy, I begged the patient and his friends to dismiss any apprehension, assuring them that all would be right in a few hours. Accordingly, next morning I found no trace of the evening's disturbance, and from that time forward everything went on well. The patient at once felt relieved from a load that had pressed upon him more or less severely for so many years, and quickly regained his health and strength; so that, while still under my care, having an offer of service similar to that which he had previously been compelled to decline, he did not hesitate to accept it; and, although circumstances afterwards prevented the expedition of which he was to have had the command, there was no longer any difficulty on his part. He continues in the enjoyment of perfect health, and in writing to me has thus expressed himself:—"I may now say, too, that no words can express the delight I feel at finding myself free from this horrible complaint, of which upwards of twenty years' experience has assured me that a cure could not have been effected by any other means."—*Monthly Journal of Med. Science, July*, 1851, *p.* 19.

[The following case is given as an illustration of the immediate effects of this operation.]

R. L., aged forty-five, a railway porter, recommended to my care by Dr. Flucker, of Berwick-on-Tweed, entered the hospital on the 25th of January last, in a sad plight from the combined effects of stricture, fistula in perineo, and phymosis. The integuments of the penis, scrotum, and pubes were greatly swollen and indurated, so as to present a most formidable appearance of morbid derangement. The prepuce was not only contracted, but singularly elongated and contorted, so as to

form a spiral appendage extending several inches beyond the glans. The scrotum and perineum constituted one mass of induration, with deep fissures and fistulous openings, through which the urine passed without being under control by the patient, who was thus kept constantly in a state of the greatest discomfort. The disease, it was stated, had commenced between five and six years ago.

On the 27th I cut away the redundant portion of prepuce, and united the edges of the skin and mucous lining by sutures.

On the 30th I made a free longitudinal incision through the raphé, and directed poultices to be applied.

On the 1st February, the swelling being greatly reduced, and more free access to the urethra having thus been obtained, I succeeded in passing No. 1 bougie through the stricture, which was anterior to the bulb.

On the 10th February I passed a grooved director into the bladder, and divided the stricture by external incision. There was not more than two teaspoonfuls of blood lost at the operation, and none at all afterwards. The catheter was withdrawn at the end of forty-eight hours.

The patient rapidly improved from day to day, and was dismissed in every respect perfectly well on the 11th March.

*Case of Illustration of the Remote Effects.*—Six years ago, a gentleman, about forty, applied to me on account of stricture, for which he had repeatedly been under the care of Mr. Liston, both here and in London. I succeeded in dilating the canal, and gave the patient bougies to pass occasionally in order to prevent relapse. Although able from long experience to do this very expertly, he found it impossible to keep the canal patent to the full extent, and every few months returned to get another stretch. As he resided on his estate, at the distance of about sixty miles from Edinburgh, these frequent journeys were not very convenient, and he also began to fear that the stricture was gaining ground, so as to render his efforts inadequate even for palliation. In these circumstances he requested me to divide the seat of contraction, which was at the bulb, and I did so in the month of March, 1847. Not the slightest bleeding, or other inconvenience, was experienced, and the water flowed entirely by the natural route. After this the patient still passed a bougie occasionally, but no longer felt any difficulty in doing so, and was also relieved from a variety of unpleasant feelings which had previously annoyed him, even when the urethra had been fully dilated.

About two years ago this gentleman suffered an attack of hemiplegia of the right side, which so impaired the use of his hand as to render him unable to pass the bougie, and then he ascertained the full extent of benefit derived from the operation, since the complaint, instead of becoming rapidly aggravated in this helpless state, has been found, upon examination, to show no troublesome disposition. I passed the full-sized bougie lately with perfect freedom, after a lapse of twelve months, during which no instrument had been introduced.—*Monthly Journal of Med. Science, August*, 1851, *p.* 146.

[The following is another case recently added to the list which Mr. Syme has brought forward in support of the superiority of his operation.]

J. H., aged forty-three, late sergeant in the —— Dragoon Guards, was admitted into the Royal Infirmary on the 19th June, on account of stricture. He stated that the disease had originated from gonorrhœa, and troubled him for eighteen years,—in the earlier part of this period being relieved from time to time by the introduction of instruments, but latterly resisting all attempts to accomplish this, so as at length to require his discharge from the army, which had taken place seven months before. During the last eight or nine years, he said, that although under the care of very many practitioners, civil as well as military, some of whom had tried daily for months to introduce instruments, *he never had had one passed through the stricture.* About six years ago an attempt had been made to force a way through the contracted part, which was at the bulb, by means of a lancet-catheter, but without success. Notwithstanding some relief which the patient had derived from passing a flexible bougie down to the obstruction, which he did daily, all the symptoms of stricture existed in a very severe form, the urine frequently escaping only by drops, and not being always under the power of retention.

After repeated ineffectual attempts, but without ever drawing a drop of blood, I succeeded on the 6th of July in passing a No. 1 bougie fairly into the bladder.

I then endeavoured to carry on the dilatation, but without success, and in order to obtain room for the introduction of a grooved director, on the 11th tied in a catheter of the smallest size. On the 13th, as the patient began to complain of this instrument, I removed it, and found that the grooved director could be passed with ease. Circumstances induced me to delay the operation until next day, when I found that the canal was again so tightly contracted as to admit only the small catheter, which was therefore retained for other two days. On the 16th I performed the operation as usual,—the patient declining chloroform, and treating the affair as unworthy of complaint. The catheter (No. 7) was removed on the 18th, and the urine then issued in a full stream entirely through the urethra. A few days afterwards, the patient, having got up and walked about, found that a part of the water escaped by the wound, but soon observed the amount of what passed in this way diminish to a few drops, and on the 6th of August reported himself quite well. He was dismissed cured on the 12th.

With regard to this case, it may be remarked, in the first place, that the disease which was the subject of treatment had deprived the army of the finest looking soldier I have ever happened to see. Secondly, it affords an instance of a stricture for nine years reputed impermeable by metropolitan as well as provincial, public as well as private surgeons, but which, nevertheless, proved permeable to the simple bougie, when employed under the impression that there is no true impermeability. Thirdly, the case presents another instance of the ease, safety, and efficiency with which the most obstinate stricture may be remedied by incision upon a grooved instrument passed through the contracted part of the canal.

I have now operated, without the loss of a single life, on fifty-one cases of stricture deemed irremediable under ordinary treatment; and I therefore venture to hope that the persuasion which I originally expressed as to the operation, when properly performed, being absolutely and entirely free from danger, will not appear unduly sanguine.—*Monthly Journal of Med. Science, Sept.*, 1851, *p.* 235.

[On this subject the 'British and Foreign Medico-Chirurgical Review' concludes a searching article with the following observations:]

Strictures of the urethra had often been divided upon a grooved director, or its equivalents, before Mr. Syme wrote; but to him undoubtedly belongs the merit of systematising the operation, and of exhibiting its peculiar advantages. He has shown that it is a proceeding of no great hazard, and far more effectual than the old operation without a director, as well as much less dangerous to the patient. On this head Mr. Syme observes, in the 'Edinburgh Monthly Journal' of April last:

"As to the danger of the operation, I contend, that if the incision be made in the mesial line of the perineum, there is no vessel of the slightest consequence that can be cut; and that, if the deep fascia of the perineum is not divided, which it never requires to be, there cannot take place extravasation of urine, unless, perhaps, forwards in a slight degree into the scrotum, where it may occasion a little suppuration, utterly unworthy of attention, when compared with the great object in view. I therefore maintain that the operation is absolutely free from danger; and appeal to the fact, that I have performed it between forty and fifty times without a single fatal result."

The statement here quoted may be somewhat too strong: for all operations performed on patients suffering from long-standing stricture are notoriously hazardous; and in severe instances, this very operation has ended fatally. The danger arising from hemorrhage has probably been altogether exaggerated, especially by Mr. Lizars and others.

The important point remains, to determine to what classes of stricture the operation is applicable, and whether the result is permanent or the reverse. It is idle to say that most strictures can be cured, and ought to be cured, by the simple bougie; no one doubts the truism, and least of all Mr. Syme, who throughout his writings has been careful to guard against the indiscriminate adoption of the perineal section. But there *are* strictures, which we believe to be absolutely irremediable, except through some such operation as this.

That form of stricture, or almost obliteration of the canal, which takes place after rupture of the urethra from injury, is, we conceive, likely to be very greatly benefited by division; and likewise that kind of stricture which contracts again

almost as soon as it is dilated, and which has been called elsewhere the resilient stricture.

Lastly, also, where time is of the utmost importance to the patient, as is the case with many labouring men, the operation would, we conceive, be justifiable, when the stricture is very obstinate.

Of the permanency of the cure, we have no sufficient evidence; but that after division, the disease *may* never return, is clear enough from the history of Mr. Syme's first patient, and is also supported by a case reported in the 'Medical Times' of April 27, 1850, by Mr. Henry Smith, in which the old operation was performed by Mr. Fergusson. The reverse of this is likewise proved, however, both by Dr. Dunsmure, and by others; and, therefore, every prudent person would advise the occasional introduction of a bougie after this operation; as after the cure by simple dilatation.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 146.

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## 103.—ON THE TREATMENT OF STRICTURE OF THE URETHRA.

By G. J. Guthrie, Esq., F.R.S., &c.

[Speaking of Mr. Stafford's mode of dividing stricture of the urethra, which consists in excising the stricture by means of a small lancet or other shaped knife, passed along a straight or curved catheter, having a slit in the point, Mr. Guthrie states, that a small obstruction may be divided in this manner safely; but if greater in extent, or more solid in consistence, the operation is attended with danger, and has even failed altogether.]

For the purpose of securing the passage of the dividing instrument in the right direction, Mr. Stafford proposed to pass a fine wire through the stricture in the first instance, and then to run his knife along it: a grooved director has been suggested by others. The difficulty is, however, to pass the wire or director; for when a wire can be safely passed through a stricture into the bladder, the disease ceases to be immediately dangerous; the urine can be drained off, and the passage may be quickly enlarged, so as to admit of a safer mode of proceeding—viz., by dividing the obstruction from behind forwards. This enlargement can be accomplished by running a hollow instrument over the wire, which has been passed, after the manner lately recommended by Mr. Wakley, junior, and it is impossible to speak too highly of this invention,—or as it is disputed as an invention, and claimed by others,—of its re-introduction into practice, as a means of effecting either a slow or a rapid dilatation of the urethra. It is, like all other potent means, liable to do much mischief as well as good, when in incautious hands; and in cases of long standing cannot effect a permanent cure any more than any of the other dilating methods more commonly in use. It is capable of rendering great service when the withdrawal of a sound or catheter cannot always be certainly followed by the re-introduction of another, and which withdrawal it renders unnecessary until a larger one is introduced over it—a very great improvement, which no surgeon should neglect, for when this can be done, no operation is immediately necessary. M. Leroy d'Etioles has recommended a similar mode of cure, or of forcible dilatation, by passing in immediate succession several graduated instruments until the last fills the urethra; thus stretching or lacerating the stricture, sometimes effecting a cure in a few days, sometimes giving rise to inflammation of the bladder or other evils, which few people like to contemplate. These means, as methods of cure, can then only be recommended when, from circumstances, the patient cannot afford time for more gentle treatment. They succeed frequently when the disease is confined to the mucous membrane; and some of the best and most prominent cures I have effected have been in such cases, and when I have felt that the edge of the stricture has caught upon and yielded to the pressure of the point of the instrument: whence my predilection for the more surgical proceeding, by division from behind forwards, when it can be effected.

When no immediate urgency presses for the hasty completion of an operation, as in ordinary cases of intractable stricture, permeable to a certain degree to the urine, although not to an instrument, it is always best to proceed with gentleness; for I have often found that an instrument can be introduced at one time, when it totally fails to proceed at another. Mr. Syme has denied the impermeability of

stricture to a small instrument under any circumstances, which denial does not gain implicit credence with the best informed members of the profession of surgery, although all ought, and I hope do admit, that his efforts to impress on the members of that profession the necessity of continuing their endeavours to find a passage until they succeed if it be possible, are deserving of the highest praise.

The width or extent of a stricture can always be ascertained when it is passable by a small silver or whalebone sound having a little bulb at the end, which on being withdrawn is caught behind the stricture, and comes through it with a jerk, thus showing its thickness.

*Case* 8.—An officer applied to me with two strictures, one an inch from the orifice of the urethra, the other at about four; he suffered greatly from irritation and a frequent desire to make water, which rendered his life very uncomfortable, although he could pass a bougie of small size easily. Both strictures were divided on different days with facility, one from before backwards, the other from behind forwards, and the cure was rapidly completed. This gentleman does not pass a bougie, has had no return of the complaint, has married, has three children, and boasts of his cure.

*Case* 9.—A gentleman had been under the care of several surgeons as well as myself, and could pass a No. 14, and even a 16, in a satisfactory manner, but his uneasiness about the bladder and the urethra was not removed; and if he neglected to pass his instrument for a couple of months the canal contracted a little, so as only to take a No. 12, and a slight ridge was felt as the sound passed over the part. This I divided, with the happiest effect; the uneasiness was no longer felt, and he now only passes his sound to be quite sure his complaint is not returning, but not to prevent its return.

*Case* 10.—A serjeant of exemplary character was sent to me by his commanding officer, suffering from an impassable stricture, and rendered thereby unfit for further service unless I could give him relief. The stricture was at the bulbous part of the urethra, through which I could not pass either a soft or a solid instrument without more force than I thought fit to employ. A slight division of the face of the stricture enabled me to carry a small silver catheter through it, which was retained in the bladder. Exchanged in succession, for others somewhat larger, the cure was apparently completed by dilatation, and he returned to his duty free from complaint, with the direction to pass a solid sound once a week. This he failed to do, and in less than two years he returned to me nearly as bad as before. The stricture was entirely divided this time, and he again returned to his regiment. He has remained well many years, not forgetting to pass his sound from time to time, that he may be sure his complaint shall not return.

*Case* 11.—An officer of the navy applied, in consequence of an intractable stricture at the termination of the bulbous part of the urethra. He had been under thirteen different surgeons, who had never been able to pass an instrument into the bladder, and was subjected to rigours amounting to a paroxysm of ague, whenever the surface of the stricture was irritated by even moderate pressure. It was evident to me that nothing but incision was likely to succeed. A slight one rendered the small orifice of the stricture more open, and a very small sound was with some difficulty carried into the bladder; this was replaced by larger ones until he could pass a bougie equal to the size of his urethra, which he does from time to time, and remains well, although the occasional passage of the bougie is necessary to prevent a relapse.

*Case* 12.—An officer of the Indian army applied to me in consequence of a hard elastic stricture at the termination of the bulbous part of the urethra, on its becoming membranous, which gave him great annoyance, though passable and dilatable. The dilatation could not be maintained by any sized bougies. The obstruction was always felt by the instrument in passing over it, and more or less uneasiness was always present. As he was desirous of being relieved at all hazards, I divided the hardened part, or ridge, with a full-sized instrument, which then passed into the bladder with ease. A little discharge of blood took place, but not more than frequently follows on such occasions. The next day I found that he had had an oozing of blood all night, that he could not make water, although the desire was constant, and was in great pain, the bladder being much distended. He had had rigours in the night, followed by considerable fever, thirst, foul tongue,

headache; the oozing of blood continued, accompanied by the occasional discharge of a few drops of bloody urine, and of some clots of blood. A middle-sized silver catheter passed with ease, although very little bloody urine came through it, and it was evident a larger quantity of blood had passed backwards, and had coagulated in the bladder, than had been discharged externally. Relief was given by injecting the bladder from time to time with warm water, by opium, and the hot bath, &c. The cold and hot paroxysms of fever returned regularly, which he considered to be his Indian malady, and were ultimately arrested by quinine. His complaint was, however, cured, and has not returned during the last six years, as he calls to be examined from time to time. This was the most distressing case of hemorrhage I have met with, although it sometimes occurs, but to a less extent, after this operation, but not sufficient to excite alarm, or give rise to any serious inconvenience.

*Case* 13.—C. P—— applied to me on his return from India in a miserable state of health, unable to make water even in a small stream, from strictures, which admitted with difficulty the smallest bougie. The first was situated two inches from the orifice; the second at the junction of the bulbous with the membranous portion of the urethra, under which he had laboured for several years. The first could be felt as a very hard swelling in the under part of the urethra, near half an inch in extent, and on which dilatation and caustics, used by different surgeons, had made no permanent impression. This part I divided from before backwards, so as to admit a No. 6 catheter, which after a time passed through the second, and his health rapidly improved as the irritation was removed. The hardness in the first stricture did not diminish, and it was again divided, so as to admit a No. 9. A small calculus was now discovered behind it, lodged in a hollow it had made for itself, and in which it had perhaps increased in size. This, after repeated trials and the further division of the stricture, was happily brought through it, but passed the orifice of the urethra with great difficulty. A catheter the full size of the urethra was kept in the bladder, and the posterior stricture was removed, but the anterior one remained hard and frequently somewhat irritable, although his health was quite restored, and he could pass a No. 8 easily. It was again divided as deeply as was thought advisable, and the nitrate of silver ointment applied, which always removed the irritability; so that by passing his bougie himself, and occasionally applying the ointment, he kept himself in good health. With the view of making a more permanent cure, a consultation was held, and the iodide of potassium ointment applied externally and internally, instead of the nitrate of silver ointment, but did not answer so well. He ultimately returned to India in excellent health, satisfied to pass his bougie and use his ointment occasionally. He has remained free from inconvenience, having since his treatment passed several small lithic acid calculi with little difficulty, although the hardened ring of the stricture was always to be felt, and is still, I have no doubt, perceptible.

*Case* 14.—A poor man was admitted under my care into the Westminster Hospital, with a diseased bladder and strictures; the first of which, about two inches from the orifice, had become impassable, so that his water, which he could before only make by drops, was now entirely retained. As he had suffered much, and appeared to be in an almost irrecoverable state of health, requiring immediate assistance, if it could be given in time to be of use, I divided the *first* strictures, which were hard and double, extending for an inch, with a small interval between them, with an instrument as large as the orifice would admit. This gave him great relief, as he could then pass his water in a small stream. Two days after, some urine came through into the skin of the penis and scrotum, which required to be divided to allow of its exit, and a fistulous opening would thus have been made, if the man had not died exhausted by the long continuance of his complaint.

*Case* 15.—A short, fat gentleman, of 63, informed me, in May, 1850, that he had been under my care, for retention of urine, twenty years before, and that he had left me when I could pass a No. 12 with ease, being as large an instrument as would enter the orifice of the urethra; and that he had done nothing since. He was nearly as bad as before, his water passing only by drops. The obstruction was at the termination of the bulbous portion of the urethra; and although a very fine gum elastic or catgut bougie could be made to enter the stricture, and stick

fast in it, neither they, nor the smallest solid one, would proceed, without a force being used which I considered incompatible with safety. Having neglected to call for a few days, he sent for me, saying, he was totally unable to pass a drop of water, and had not done so for nearly two days, the bladder being distended as high as the umbilicus. There was no time to be lost, if his life was to be saved. I therefore divided the obstruction, which was very thick and tough, with great difficulty. The cutting part being sheathed, the instrument could then be felt per rectum, advancing to the prostatic part of the urethra; but it would not enter the bladder, nothing could make it do so. It evidently caught upon something at the very entrance into it, and I concluded it must be on the bar I have indicated as often existing at this part. This I divided; the instrument then entered the bladder, and three pints of urine were drawn off through it, when it was exchanged for a soft metallic catheter. The general bad symptoms gradually subsided, the urethra remained hard and lumpy where the division had taken place. In August, I took my leave of him, in a very comfortable state, passing his gum catheter twice a day, and making his water occasionally very well. At Christmas I saw him, when he declared himself free from any uneasiness. In February, he suffered an attack of bronchitis, for which he did not ask my assistance, although I paid him a visit of condolence, declaring himself well of my complaints—that is, of the bladder and urethra. In April he died from a fit of apoplexy, and his friends would not allow of an examination. The surgeon who attended with me did not hesitate in saying, that if I had performed the operation by opening the perineum he would not have lived many days.

*Case* 16.—H—, returned to England from Australia, in July, 1848, having suffered severely from an impassable stricture, placed himself under the care of several very eminent surgeons in London, who tried various methods and inventions, and ended by making him a false passage, admitting a No. 7 for eleven inches, but which could not be got into his bladder. All this time he suffered severely in his health, from repeated attacks of aguish rigours, and was told, at last, that nothing could cure him but being cut in the perineum, to which he had a serious objection; and instead of going to Edinburgh, as advised, returned from the country to London, and was advised by the subject of case No. 8 to go to Mr. Guthrie, with the determination to be cut on the inside of his urethra, if he pleased, but not on the outside. The operation was performed, after due preliminary examination, on the 27th of March, and a catheter introduced, which gave him great relief with respect to his water, but was followed by some fever, but not sufficient to prevent his going to Mr. Guthrie's house after the first few days. A swelling then formed at the anterior part of the scrotum, which was opened, but contained only matter, without any sign of urine. Pain, supposed to be rheumatic, next affected the back part of the left shoulder, and was soon followed by swelling, without discolouration. As this was supposed to contain matter, it was punctured, on the 30th of April, by a very small trocar, and six ounces of good pus were allowed to run through it. The operation was repeated every second or third day, for three times, when the little opening was enlarged, and the discharge gradually ceased. A No. 12 silver sound was passed every other day, and he left London, doing it for himself, at the end of May, in health and spirits. This gentleman was fortunate in having his matter deposited first in the scrotum, and afterwards under the muscles of his back.

The division of a stricture from behind forwards, implies that it is passable by an instrument of moderate size, say a No. 4, 5, or 6, and that the operation is not consequently one of necessity but of choice, with the hope that it may lead to a permanent cure, which it is very likely to effect. In many cases of intractable strictures, I have found it advisable to puncture the fore-part, without attempting to divide the whole thickness of the stricture at once, and have thus been enabled in many instances to introduce an instrument which cut from the side and not from the point, thus depriving it of its most dangerous quality. The instrument I place before you was made more than twenty years ago, by Messrs. Philp and Whicker; it is one of several, having each a somewhat different inclination. The instrument is round, straight, and of equal size throughout unto the end, the under part of which forms a bulb or ledge sufficiently developed to catch against the stricture when passed through it, and then withdrawn until it meets with the check the

inner side of the stricture occasions by catching against the ledge or bulb. The cutting part being then protruded on the under side by the pressure of the thumb on a spring, the instrument is to be drawn through the stricture, which it divides; the pressure of the thumb being removed, the cutting part returns into its sheath, or it may, if found necessary, be pushed forward through the stricture, thus deepening and completing the cut already made, or even making another by the side of the first, if thought advisable. The operation thus simplified may be repeated if required with a larger instrument, until the wall of the urethra itself, as well as the stricture, are both completely divided, if it should so please the surgeon; a proceeding which appears to me to be of more than a doubtful nature. The error, when one is committed, lies in trying to do too much at once, for although an insufficient incision will not effect a cure, there is no difficulty in augmenting either its length or its depth, when the insufficiency is manifest. It is a point to be acquired by experience, and the surgeon will soon learn that the incision, however well made, is never equal to the width of the blade of the instrument, from the natural receding of the parts. It should extend from a little behind quite through the stricture, and about a line in front of it, and a ledge should not be left behind on which the point of a bougie can hitch. When the division of a stricture has been accomplished, a straight sound, very slightly conical at the point, should be passed through it, until the distension *begins to give pain*, when it should be withdrawn, to be re-introduced again next day; until by successive introductions, and if necessary by successive divisions, the thickened or hardened parts have been absorbed, and the canal becomes free.

The division of a stricture, whether done from behind forwards, or before backwards, gives rise in some persons to a sympathetic fever, resembling ague, which may continue for several days; but the same thing takes place in many irritable habits from the mere introduction of a common bougie, and is an evil which cannot always be avoided by the greatest care or gentleness. I have known hæmorrhage of a more serious nature follow, in the ablest hands, the introduction of a common silver or elastic catheter, than that which sometimes supervenes after the division of a stricture. If this should not cease, in due time, under the application of very cold or iced water, a full-sized bougie should be introduced into the bladder, and pressure made upon it at the part injured. When much force has been used, or the outer wall of the urethra has been too much implicated, an ecchymosis of the external parts is said to take place, although it has not occurred to me. Urine may be extravasated, matter may form externally, or be discharged in quantity from within. These are accidents it is proper to enumerate, and which may befall any one, although they do not often occur, and are not to be expected when the treatment is conducted with sufficient precaution and judgment.

In whatever manner the urethra may be divided, whether for a stricture only or for a fistula in perineo, any and every operation may lead to the excitement of a fever resembling ague in its paroxysms, and to the formation of matter in different parts of the body in a similar manner to that which I believe I was the first to show did often happen after amputation. It is a misfortune which cannot be avoided, and he is fortunate in whom these depositions of matter occur in parts not essentially vital, as in Case 16.

*Case* 17.—J. G——, aged thirty-one, has resided fourteen years in India, and has suffered from stricture during the whole of that time. "In 1838 a No. 8 could be passed into the stricture, but not into the bladder, which relieved me a little, but a discharge remained. In 1842 a No. 4 would not pass. In 1845 a No. 9 would go through the first obstruction, but not into the bladder. In 1849, being worse than ever, I placed myself under another surgeon, who succeeded in passing a No. 1 into the bladder, and at last a No. 9, but only with great pain and force, so that it could not be withdrawn, only by putting a purchase upon it to pull it out. A swelled testicle, and an abscess in the scrotum, followed this treatment, and a gleet has been present since 1838, with great irritation and suffering. In April, 1851, I applied to Mr. Guthrie, having come from India for this purpose. He passed a small 5 with difficulty, and stated that I had three strictures—one half an inch from the orifice, which felt like a ring; the second, immediately in front of the scrotum, which felt hard, like a cord, for the space of an inch; and a third, at the curve, which he called a natural obstruction, but against which for

several years my bougie always stopped. Mr. Guthrie divided my second stricture from behind forwards, so as to admit a No. 8 with ease, and which removed at once all my sufferings. The first stricture was divided a few days afterwards, and a No. 11 went into the bladder without difficulty, leaving me in a perfect state of bliss. I can now pass a No. 13, and think myself cured."

I have selected those cases from a great number, because each proves a leading point; and from them I shall now draw such conclusions as they appear to admit.

*Conclusions.*—1. That a hard and elastic, or an intractable stricture is never permanently cured by dilatation, or by the application of caustic, although it may be materially relieved by the regular periodical use of a dilating instrument.

2. That the division of an old, hardened, or elastic stricture through the perineum is not usually followed by a permanent cure, although it is always attended by immediate relief. The disease being apt to return unless a solid sound or catheter is occasionally passed to prevent it.

3. That the operation of dividing the perineum and urethra in such cases is sometimes attended by severe hemorrhages, by fever, and is occasionally followed by fistulous openings, giving rise to much inconvenience.

4. That such division does, in some instances, effect a permanent cure.

5. That the division of the urethra through the external parts should never be attempted in any portion of it anterior to the bulb, such operation not being necessary; for the narrowest stricture of the pendulous or moveable part may always be divided internally with much less comparative danger than by the external incision, inasmuch as the instrument can be guided through this part by the finger and thumb of the left hand of the surgeon with a certainty almost unerring.

6. That the stricture considered by all surgeons as the most important and difficult of cure—viz., at the termination of the bulbous portion of the urethra—may always be divided, when impassable, by a *straight* instrument, and in general more easily than by a *curved* one; the use of which is founded on the erroneous belief that the stricture is situated in the membranous part of the urethra, instead of being, as it is, anterior to it.

7. That the division of a stricture should, if possible, be effected by an instrument passed through it, and cutting from behind forwards, rather than from before backwards, although a combination of both methods will frequently be necessary to ensure success.

8. That the division of a stricture by these means will not always ensure a permanent cure if more than the mucous membrane is implicated, unless such parts be divided also.

9. That in cases of intractable stricture, the mucous membrane, the inner layer of involuntary muscle, and the elastic tissue external to it, should be divided when the operation is done from within, but not the outer layer of muscular fibres, which should remain as a barrier between the stream of urine and the common integuments of the external parts—an accuracy of division not always to be attained: whence, perhaps, the difficulty of effecting a permanent cure.

10. That when a permanent cure is effected in these cases, the divided elastic wall of the urethra is not re-united by a structure exactly similar to itself but by common areolar tissue, rendering the part more dilatable under the pressure of the stream of urine; the formation of which dilatation can be aided during the progress of the cure by pressing on the divided part with the point of a solid instrument passed daily for the purpose of preventing, if possible, that contraction which always takes place during the progress of cicatrization; a proceeding which cannot be advantageously adopted when the parts are divided through the perineum, lest it should encourage the formation of a fistulous opening, to which there is always a tendency.

11. That in cases of intractable stricture accompanied by one or more fistulous openings in the perineum, in *young persons*, or of middle age, the operation through the external parts, or along the urethra, may be resorted to at the pleasure of the surgeon with an equal chance of success, provided the portion of the obstruction or bank preventing the free passage of the urine be effectually divided, the *sine qua non* of the operation.

12. That the operation within the urethra should always be preferred in *elderly*

persons, particularly if somewhat stout or fat, as less likely to create severe constitutional disturbance, as shown in Case 15; and if this operation should fail from any cause, it by no means interferes with the due performance of the other through the perineum, which in serious cases then becomes imperative, as the last resource capable of giving relief.—*Lancet, July* 7, 1851, *p.* 617.

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104.—*On a New Method of Applying Caustic in the Treatment of Stricture.*—By JOHN L. MILTON, Esq., London.—[In the present divided state of opinion in the surgical world as to the treatment of stricture, any contribution likely to increase our mastery over it cannot fail to be interesting. The following is a novel and simple mode of applying the caustic.]

The general plan is to direct a small hole to be made with a pin in the extremity of the bougie, and into this is inserted the piece of caustic destined to be applied to the stricture; or else we have armed bougies.

The objections to these are, in addition to those which have made so many surgeons abandon them for the plan of fixing the caustic themselves, that in many cases, especially in the country, armed bougies cannot always be had recourse to, as they are not always to be had when they are wanted, and that they are more expensive.

The plan of cutting a piece of caustic is not free from objections; it is somewhat tedious, and the caustic sometimes projects and comes loose. Not that I believe there is anything to be apprehended from this, unless it be very large, but it alarms both the surgeon and patient, and, in some irritable strictures, produces a very unnecessary amount of spasm and suffering.

The plan I now propose is somewhat similar to Hunter's way of applying caustic to pustules in the eye. The place where the caustic should go being cut flat on the bougie with a knife, and then made a little rough, a piece of caustic is laid on a sixpence, and fused in the flame of a candle; the rough spot on the bougie is dipped in the fluid, and is instantly coated smoothly with caustic. It is then dipped in the tallow, and twirled gently round till this sets, so that it has a smooth button-shaped sheath of fat. All that is now necessary is to clear the way to the stricture with a large bougie, and then to pass down that which has just been armed. The advantages of this plan are—

1. That we can fix the caustic to any part of any bougie.
2. That we can regulate the quantity with the greatest exactness.
3. That there is no waste; for what is left on the silver cools and hardens, and can be used another time.
4. That the surface is smooth, and does not irritate the urethra.
5. That these bougies are simple, cheap, always attainable, and efficient, and that (the caustic being protected by the fat from the action of the air and moisture) they may be prepared beforehand during leisure moments.—*Medical Gazette, July* 4, 1851, *p.* 43.

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## 105.—PRACTICAL OBSERVATIONS ON THE TREATMENT OF PERMANENT STRICTURE OF THE URETHRA.

By ROBERT WADE, Esq., Senior Surgeon to the Westminster General Dispensary.

[The following practical remarks upon the treatment of urethral obstructions cannot fail to be of great utility, especially as they are the result of considerable experience in investigating the effects of different curative measures, applicable to such affections. Mr. Wade first enters upon the different modes of treatment. He says]

The means adopted by surgeons for the removal of strictures of the urethra are —1st. Dilatation. 2ndly. The application of caustic. 3rdly. Division of the stricture, either from within, by the lanceted catheter, or from without, by perineal incision. Dilatation is the most simple, and, in my judgment, the best method of proceeding where it is found to answer. It is the one usually adopted, and, when carefully conducted, causes generally but little pain or irritation. Many surgeons

have their favourite instruments for effecting dilatation, some giving a preference to the silver catheter, others to the solid metallic sound, whilst the elastic gum and plaster bougies have also their advocates. When strictures will bear them without much irritation, metallic sounds or catheters, particularly the former, are, I believe, generally the best instruments to employ; indeed, in old hard strictures they are frequently the only efficient dilators. There are, however, many cases where their introduction either causes too much irritation, or cannot be effected, and in which the plaster bougie will be found of great value. The catgut bougie is principally useful in cases of retention of urine. I very rarely use the gum elastic bougie, as its extreme flexibility renders it difficult to know where the point of the instrument is pressing. The conical bougie, which gradually tapers from within an inch or two of its point, has always appeared to me to be objectionable; for, unless of very small size, should it meet with obstruction in passing along the urethra, it will be almost impossible to know whether the point of the bougie or its increasing diameter, constitute the impediment to its advance. The intervals for the introduction of instruments, as well as the time they should be retained, must be regulated by the degree of irritability of the urethra and bladder in each particular case. Very little attention will be sufficient to instruct the surgeon what length of time it is best to allow an instrument to be retained, as also the proper period for its re-introduction. As a general rule, instruments should not be kept in the urethra less than from five to twenty minutes; and in old hard strictures, I usually let them remain from half an hour to an hour. Mr. Syme tells us that bougies should not be permitted to remain in the urethra more than one or two seconds; as, however, the bougie must be regarded as exerting a mechanical as well as vital action, I do not understand how it will be possible, by its retention for so short a time, to accomplish the dilatation of a stricture of any standing. The mere passing a bougie through the obstruction, I believe, will often increase the irritability of a stricture, when the retention of the instrument for a few minutes would have considerably diminished its morbid sensibility. As the treatment of stricture by dilatation is that which is usually adopted, I shall conclude my remarks upon that method by a few summary observations. As a general rule, the more gently and gradually the dilatation is effected the more permanent will be the relief afforded. In the majority of strictures, especially when of long standing, silver catheters, or steel sounds plated, of a proper length and curvature, especially the latter, from their having more solidity than the former, are the best dilating instruments. Dilatation, by retention of catheters,—a treatment which has lately had its advocates,—should, as it appears to me, be employed only in a few cases of a particular character. My reasons for objecting to the general employment of that method are the following:—1st. That rapid dilatation, even when accomplished under the most favourable circumstances, according to my experience, is seldom so satisfactory in its results as when that process is more slowly effected. 2nd. That the prolonged retention of instruments is likely to cause no slight degree of urethral irritation and inflammation, which, in irritable habits, will very probably not be confined to the urethra, but affect the bladder also. To these inconveniences may be added the occasional occurrence of abscess in the prostate, or perineum; and, perhaps, more or less condensation of some portion of the cellular tissue immediately external to the urethra, as well as constitutional disturbance of a more or less serious character. 3rd. This treatment requires strict confinement of the patient to his room, a low diet, and, frequently, a rather free administration of opiates, which, although they may be regarded as mere trifles by the rich and strong, are of no trivial import to him who must live by head or hand; nor are they to those whose vital powers have become depressed by long suffering. There are, however, some advantages to be gained by this plan of treatment; and, in some cases, notwithstanding the risks and inconveniences of the method, it should be adopted. In cases of retention of the urine, where there has been considerable difficulty in the introduction of the catheter, it should be retained, if practicable, for a period of from twenty-four to forty-eight hours. When there are false passages, and some difficulty is experienced in getting an instrument into the bladder, the treatment by retention of the catheter will often prove of great advantage to the patient. In old, hard strictures, especially when long and irregular, the occasional retention of a catheter for a day or two will sometimes much facilitate their subsequent dilatation. In

irritable strictures, when the introduction of instruments is usually succeeded by rigours, Sir B. Brodie recommends this method, having found that retention of a gum catheter, by protecting the irritated lining membrane of the stricture from the contact of the urine, effectually prevented the occurrence of rigours. In similar cases I have, however, often succeeded in removing the irritability of the strictures by two or three very mild applications of potassa fusa. In concluding these few imperfect remarks upon dilatation, I must acknowledge that it appears to me almost impossible to prescribe such general rules as are applicable to the infinite varieties of strictures, diversified by individual peculiarities of constitution, and, consequently, requiring some modification in their management. No man can possibly predict precisely what any urethra will bear until he has fairly tried its temper.

With a few exceptions, practitioners of the present day, in their treatment of stricture, depend almost entirely upon dilatation, to the exclusion of every other means, from the supposition that it is the only safe method of proceeding. It must surely, however, be admitted, that to be successful in the treatment of any disease the means employed must be adequate to the end in view. Although dilatation, in the hands of a good surgeon, may succeed in the generality of instances, yet it will not do so in all; for cases not unfrequently occur in which other measures must be adopted, or many an unfortunate sufferer from urethral obstruction be left to drag on a miserable existence, and perhaps be eventually destroyed by the giving way of the urethra, and subsequent extravasation of urine. For the relief of such cases, caustic has been proposed and successfully employed by many surgeons of high character. I shall endeavour to place fairly before the Profession the result of my experience upon this method of treatment. It is not from any hastily-formed views upon this subject, from the attainment of success in a few instances, but from more than twenty years' observation of the effects of caustic in bad cases of stricture, that my conclusions have been drawn. The caustic potash has, indeed, proved to me of very great value in the cure of stricture in its most aggravated forms. Various escharotics had been used for the destruction of strictures, by Wiseman and others, long before the time of Hunter. In the following remarks, from Mr. Hunter's 'Treatise on the Venereal Disease,' will be seen the result of his experience of the application of the nitrate of silver to strictures:—"If the obstructions are anywhere between the membranous part of the urethra and glans, where the canal is nearly straight, or can easily be made so, it becomes an easy matter to destroy them by caustic; but if beyond that, it becomes then more difficult; however, at the beginning of the bend of the urethra the obstruction may be so far removed as to admit of the passing of a bougie, or at least to procure a tolerably free passage for the urine. I have seen several cases where it was thought necessary to follow this practice, and it succeeded so well, that, after a few applications of the caustic, the bougie could be passed,—which is all that is wanted. I look upon the caustic as a much safer method than using pressure with a bougie, on account of the danger of making a new passage without destroying in the least any part of the obstruction." In another passage Mr. Hunter observes:—"I have often tried this practice in strictures where there were also fistulæ in the urethra, and where the water came through different passages. Such cases are not the most favourable; yet I succeeded in the greater part of them, that is, I overcame the stricture and could pass a bougie freely. I have seen several cases of fistulæ of these parts, where the natural passage was obliterated by the stricture, in which I have succeeded with the caustic, and the fistulous orifices have nearly healed." Sir Everard Home, in his well-known work on Stricture, has strongly advocated the employment of the lunar caustic. He not only used it in aggravated forms of that disease, but indiscriminately in all urethral obstructions, with a boldness and to an extent that frequently caused great suffering, such as rigours, retention of urine, and sometimes profuse hemorrhage. Sir Everard Home's work on Stricture has always appeared to me to be of great value; for, whilst the capabilities of the caustic in removing many bad forms of that disease are proved by a sufficient number of facts to convince all but the ultra-sceptical, its injurious effects are also stated with a candour well worthy of imitation. That the treatment by caustic was frequently adopted by Sir Everard in cases where the employment of milder measures would have been more judicious, and that it was pushed by him occasionally to an injurious extent, cannot be denied. That his recommendation of the

employment of the nitrate of silver in all cases of permanent stricture, led, in many instances, to a fearful abuse of the remedy in the hands of others must also be admitted. Mankind generally are apt to entertain extreme views, and because rigours, false passages, and sometimes debilitating hemorrhages were found to result from the caustic treatment, or rather its abuse, a really valuable means of cure in many intractable cases of stricture, was soon abandoned by the generality of surgeons. After the ample evidence of the powers of the nitrate of silver in removing many strictures that had remained impermeable to the bougie, recorded by Hunter, whose truthfulness and accuracy of observation are unquestionable, besides the great number of cases of a similar character mentioned by Sir Everard, one would imagine that the *capability* of caustic to destroy many obstinate forms of urethral obstruction could scarcely be questioned by any rational being.

I shall now proceed to the consideration of the employment of potassa fusa in stricture, the only caustic besides the nitrate of silver at present used in that disease. To Mr. Whately must be ascribed the merit of having been the first to use the potassa fusa in stricture of the urethra, and of having done all in his power to make the public acquainted with its curative powers in that disease. From some cause or other, notwithstanding the strong recommendation of Mr. Whately, this truly valuable caustic has been less generally employed in urethral obstructions than the nitrate of silver. Before giving the result of my own observations regarding the efficacy of the potassa fusa in stricture, it is but right to state those of Mr. Whately. In his work, entitled, 'An Improved Method of Treating Strictures in the Urethra,' we have the following remarks:—"In every stricture, before we apply the potassa fusa, we ought to be able to pass a bougie into the bladder of at least a size larger than the finest kind. This is necessary, to enable us to apply the caustic to the whole surface of the stricture, and likewise to put it into our power to remove a suppression of urine, should it occur during the use of the caustic. Put a small quantity of kali purum upon a piece of strong paper, and break it with a hammer into pieces, about the size of large and small pins' heads. Thus broken, it should be kept for use in a vial closed with a ground stopper. A small hole, about the sixteenth part of an inch deep, should be made at the extremity of the bougie, which should be just large enough to enter the stricture. A large blanket pin, 2¼ inches in length, with the head struck off, will answer the purpose, the hole being made with the point of the pin. Some of the broken caustic should then be put upon a piece of writing paper, and a piece less than half the size of the smallest pin's head should be selected; the particle cannot be too small for the first application. Let this be inserted into the hole of the bougie, and pushed down into it with the blunt end of a pin, so as to sink the caustic a very little below the margin of the hole. To prevent the kali from coming out, the hole should be contracted a little with the finger, and the remaining vacancy in it filled up with hog's lard. When the bougie has reached the anterior part of the stricture, it should rest there for a few seconds, that the caustic may begin to dissolve. It should then be pushed very gently about one-eighth of an inch, after which there should be another pause for a second or two. The bougie should then be carried forwards in the same gentle manner till it has got through the stricture. When the caustic bougie has passed through a stricture, it should be withdrawn to the part at which it was first made to rest. After which it should be passed very slowly through the stricture a second time. If the patient complain of pain, the bougie should be immediately withdrawn; but if not, we may repeat the operation by passing and withdrawing the bougie through the stricture once or twice more, which will take up, in the whole, about two minutes. It is essential that the bougie pass through the stricture at each application of the caustic. We ought, therefore, to pass the bougie we intend to use once through the stricture before the kali is inserted into it. At the end of seven days, the application may be repeated; and if the patient felt no degree of pain, a piece of kali a small degree larger than the first may be selected. The operation should be repeated till the contracted part of the urethra is dilated, if possible, to the natural size. We are, however, on no account to increase the quantity of caustic as we increase the size of the bougie. I do not in any case apply more of the kali purum at a time than a piece about the size of a common pin's head. Twelve bits of the largest size weigh one grain. I have in a few cases re-applied the caustic at the end of five days. There are some cases in which the contrac-

tion is so irregular, and its aperture so untowardly situate, that a bougie cannot readily if at all be passed into it; others have likewise been described, in which it is impossible to pass a bougie through the strictures. If, in the former of these cases, a bougie with the kali cannot be passed into the stricture, or if it get through the stricture and yet do not destroy the irregularity, and it becomes necessary to apply a caustic to the anterior part of the contraction, I should certainly prefer the lunar caustic to the kali purum." From the result of no inconsiderable experience of the use of potassa fusa in many intractable forms of urethral obstructions which had resisted the ordinary means of treatment, I am convinced that the excellent effects of this caustic in the cure of stricture are but little known to the generality of surgeons. It was in impermeable strictures that I first had recourse to caustic potass, and very soon became convinced of its superiority to nitrate of silver in such cases. I found that to be effective in old, hard strictures, it was necessary to employ it much more freely than was recommended by Whately, and that this might be done with perfect safety. The caustic potash may be advantageously applied to strictures for two purposes: one to allay irritation; the other, to destroy the thickened tissue which forms the obstruction. When used in the minute quantity employed by Mr. Whately, I believe its action to be simply that of allaying irritation, as, when mixed with lard and oil, combined with the mucus of the urethra, it can scarcely have any effect beyond a mild solution of caustic which most probably causes a more healthy state of the lining membrane of the stricture. To insure the action of the potass, instead of being below the level of the hole of the bougie, it should be fairly exposed, having its points slightly projecting. The bougie should be marked as directed by Mr. Whately; and if the points of the caustic be covered with lard, there need be no fear of its acting before it reaches the stricture. When used in small quantity, of the size of a common pin's head, (and less is seldom of any use,) unless a stricture be very irritable, its application usually causes nothing more than a slight sensation of heat, scarcely amounting to pain. The bougie should be gently pressed against the stricture for a minute or two if impermeable, and then withdrawn. When the caustic is applied to permeable obstructions, the bougie should be passed three or four times over the whole surface of the stricture. To impermeable strictures the caustic should be applied with greater caution than to such as are permeable; for should retention of urine occur, it will be more easily relieved in the latter than the former. It usually happens that after one or two applications of the caustic, the bougie will be found to enter the obstruction. Before applying potassa fusa to impermeable strictures, every precaution should be used to guard against irritation. If convenient, the application may be made at bed-time; and should the patient have been subject to rigours or retention of urine, it will be best to administer an opiate injection about an hour before the operation.

Contrary to what is generally supposed, potassa fusa, from its forming with oil and mucus a slimy saponaceous compound, admits of being more easily confined to the strictured portion of the urethra than the watery solution caused by the application of the nitrate of silver. This is one advantage in favour of the caustic alkali. Another, arising from this miscibility with oily substances is, that its action can be better regulated than that of the nitrate. It may be either used as a mild stimulant or as a powerful caustic. It appears to me, however, that the principal superiority of this caustic to the nitrate of silver, in the treatment of stricture, consists in its more powerful effect in removing hard strictures, and that with perfect safety, and comparatively with but little pain. It has been previously stated that, when used for the destruction of hard, gristly strictures it must be more freely applied than recommended by Whately; but the quantity should be very gradually increased, and regulated according to its effects. Some of the accidents caused by the nitrate of silver, when used for the destruction of strictures, have arisen either from the slough which it produced having so completely obstructed the previously contracted channel as to cause retention of urine; or, on its separation, hemorrhage to a considerable amount. From the tendency of the nitrate of silver to produce adhesive inflammation, it is probable that the coagulable lymph, caused by its free application, may form no slight barrier to its destructive effects. This tendency, I think, may in some degree account for the great num-

ber of applications of this caustic which were required in some of Sir Everard Home's cases.—*Med. Times, May* 24, 1851, *p.* 557.

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106.—*On the use of Twisted Bougies in Stricture of the Urethra.* M. Leroy D'Etioles addressed a letter to the Academy of Medicine in which he submitted a series of facts to show the advantages of the employment of bougies twisted spirally, in overcoming certain irregular strictures of the urethra that have resisted the ordinary instruments. The cases cited were fifty-three in number, and had all been witnessed by medical men. M. Leroy D'Etioles stated that it is not requisite that the instruments should be made specially for the purpose: it is only necessary to twist a small common gutta percha bougie twice or thrice round a large pin or wire, and letting it remain for a few minutes, when the spiral twist will have become permanent. The bougie thus formed follows the sinuosities of the stricture, but requires some skill and patience in its use.—*Med. Gazette, July* 4, 1851, *p.* 42.

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107.—*On a Case of Calculus of the Urethra and Prostate Gland, with Obstinate Stricture of the Urethra.*—By Dr. Benjamin Barkus, Gateshead, Newcastle-on-Tyne.—[This was the case of a joiner, aged 57, married, of intemperate habits, and in his youth having had gonorrhœa frequently. Has suffered from difficulty of making water for thirty years, but eighteen months ago was seized with retention of urine, followed by extravasation into the scrotum and perineum. No catheter could be passed. On the 19th of Feb., 1851, he laboured under another attack of retention and extravasation into the cellular tissue of the scrotum. Free incisions were made, and the urine passed by the openings. The sloughing of the scrotum was extensive, almost exposing the left testicle. No instrument could be passed into the bladder.]

On March 2nd, whilst endeavouring to pass a small-sized catheter, it came in contact with a calculus anterior to the bulb. An incision was made down upon it, at the junction of the scrotum and perineum, which latter was densely hard, and almost cartilaginous in its whole length. A calculus, of the size of a filbert-nut, was extracted, giving considerable relief. From this time the man's general health improved, yet it was found impossible to pass a catheter beyond the bulb, where the instrument seemed to be resisted by a dense, unyielding contraction; in fact, the urethra appeared to be obliterated. It was now resolved to make a passage to the bladder, of sufficient size to admit a full sized catheter, if possible. With the assistance of my friends, Messrs. Pearce and Gibb, I performed the operation on the 13th of March, eleven days after the first operation. He was placed in the position for lithotomy, and, after having been rendered insensible by chloroform, a catheter was introduced as far as the bulb of the urethra, and an incision made down to the point of the instrument; with the aid of a director and the catheter, gradually advanced, the incision was carried to the prostate gland, where the instrument came in contact with another calculus, which occupied almost the whole of the prostate. An incision was then carried through the lower part of the prostate, and a stone about the size of a large filbert-nut extracted, and the catheter now glided into the bladder. From this time the man has gone on well; the catheter was at first allowed to remain in about a week, but it is now only introduced occasionally for a few hours in the day. The external wound is almost healed, and very little urine flows from it.

April 8th.—The urine flows in a full stream from the urethra, and the man's general health is better than it has been for several months.

This opinion may be considered as a modification of that advocated by Professor Syme, for the cure of stricture. With the learned Professor, it is a *sine quâ non* that a grooved staff be passed into the bladder. In this case all efforts of myself and friends to pass an instrument proved fruitless. Probably Professor Syme might have succeeded, as he scarcely admits having failed to pass an instrument in every case that has come under his care.—*Lancet, July* 12, 1851, *p.* 30.

## 108.—CASE OF STONE IN THE BLADDER—LITHOTRITY AND CURE.

Under the care of Mr. Barnard Holt, Westminster Hospital.

[In employing the operation of lithotrity, it is of the utmost importance that the greatest care should be taken in the discrimination of patients.]

A satisfactory state of the general health, a pretty sound condition of the bladder, and a moderate sized stone, are requisites without which it is somewhat hazardous to undertake lithotrity; and though much is left to the discretion and discrimination of the surgeon, there are certain rules which must not be infringed. It is, however, clear that complications may occur with lithotrity, as with other operations, which the shrewdest cannot foresee, and which will baffle the most legitimate hopes and best directed skill. It would seem, however, that success is much influenced by the more or less ready manner with which the stone is seized and crushed; and though this part of the proceedings may, to the bystanders, appear of easy accomplishment, experienced surgeons know that a good deal of habit and dexterity is indispensable, not only for seizing and crushing, but likewise for the use of the scoop.

[A healthy countryman, about 65 years of age, was admitted April 14th, suffering from stone in the bladder. Five months previous to admission, he had been apparently attacked with inflammation of the kidneys, great pain being experienced in the back, and subsequently along the course of the right ureter. This pain in a short time was suddenly relieved. In three weeks after he complained of pain at the end of the penis, and likewise that his urine was occasionally tinged with blood.]

One day after the patient's admission, Mr. Holt passed a sound, but was unable to detect any calculus. The man was ordered a dessert spoonful of castor-oil every morning, and barley-water for beverage. Upon introducing the sound two days afterwards, Mr. Holt directly detected the stone, which appeared to be small and soft. The patient was kept in bed; he continued the castor-oil and barley-water, and was allowed some beef-tea.

On the fourth day after admission, the bowels having been freely relieved, the urine being copious, and the bladder not irritable, Mr. Holt injected this viscus, introduced the lithotrite, and readily caught the stone. The latter was small, very fragile, and easily broken by the slightest pressure of the screw. The crushing was repeated five or six times, without the patient complaining of the slightest pain, and every portion was apparently reduced into minute fragments. Upon passing water immediately afterwards, the patient evacuated readily a considerable quantity of dust, of the lithic acid character. He was desired to keep in bed, drink plentifully of barley-water, and to take five grains of Dover's powder, suspended in mucilage and water, every fourth hour.

For the first three days after the operation, the patient progressed very favourably, and passed moderate-sized fragments with each evacuation of the bladder. On the fifth day, no more detritus having been rejected, Mr. Holt introduced the scoop, and easily removed several pieces, without any pain to the patient. From this time to the tenth day no unpleasant symptom arose; but the scoop was once more used, in order thoroughly to ascertain whether any pieces were left. Two fragments were detected, and readily brought away. Seven days afterwards, the scoop failed to detect any more fragments, and the patient, having remained perfectly well up to the twenty-second day after the operation, was discharged. On his leaving the hospital, he passed urine only three times a day, was not compelled to get up in the night, was perfectly free from pain, and able to take any amount of exercise.

Mr. Holt remarked that in all the cases in which he had operated, he never met with one more peculiarly adapted to the operation of lithotripsy than the present: the capacious bladder and urethra, the small size and fragile nature of the stone, and excellent health of the patient, all offering the best chance of a speedy and successful termination. In this instance, *one* operation was found sufficient, the after introduction of the scoop having been had recourse to for the purpose of facilitating the removal of fragments, the non-irritable condition of the bladder being very favourable to its introduction.

It will be seen that Mr. Holt did not use the lithotrite as a sound, as he con-

sidered it much better, after having been once satisfied of the existence of a foreign body, to introduce the lithotrite, depress the lower blade, and thus form a pouch of the posterior wall of the bladder, into which the stone readily fell. Indeed, in subsequently searching for fragments, if they are small, it is almost impossible to detect them in any other way. It is, in fact, in the majority of instances, useless to introduce a sound for the purpose of detecting any fragment that may be detained in the bladder; it is much better to inject the viscus and introduce the scoop, going through the same steps as if the stone were unbroken. By depressing the posterior wall of the bladder, if there be a fragment, it is almost sure to fall between the blades of the scoop; whereas, if only searched for with the sound, the fragment may not be reached, from its probable detention by a fold of mucus membrane or its lying behind the prostate gland.

With regard to the exhibition of opium after the operation, Mr. Holt considers that it tends in a very great measure to prevent the rigours which so frequently supervene in lithotrity. In some instances a severe shivering fit will be experienced after the first, but not after any subsequent operation, unless a larger instrument be used than the urethra will conveniently bear.—*Lancet, Aug.* 2, 1851, *p.* 106.

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## 109.—ON THE DECOMPOSITION OF PHOSPHATIC CALCULI BY SOLUTIONS OF LEAD.

By Dr. S. Elliott Hoskins, F.R.S., &c.

[From cases which have occurred under his notice, Dr. Hoskins says, that not only does the bladder, under irritation, tolerate the presence of solutions of lead, but also that they act as sedatives, and exert a favourable influence, directly and indirectly, on the morbid secretion of mucus which generally, in such cases, exists. Dr. Hoskins proceeds:]

After having made trial of most of the vegetable supersalts of lead, all of which act, more or less, as unirritating decomponents, I have returned to the use of that originally proposed, the nitro-saccharate, as by far the most effective. That prepared for me by Mr. Garden, of Oxford street, is much more energetic as a chemical agent than my own, and equally mild in its physiological effects. It is likewise more decidedly an organic salt, which I consider essential to the fulfilment of the ends in view; and I am strengthened in the opinion that sugar is a necessary ingredient, from the perusal of two papers in the July number of the 'Pharmaceutical Journal'; one by M. E. Peligot, on the 'Combinations of Sugar with Lime,' and another by M. Barreswill, on the 'Solution of Carbonate of Lime in the Saccharates.'

One grain of the salt, superacidulated with five drops of strong acetic acid, is the proper proportion for admixture with each fluid ounce of water. It is essential that the salt and the acid should be incorporated before the addition of the water, and that the whole should be brought to the boiling point. Superacidulation is necessary on many accounts; it secures perfect solution, increases the decomposing activity of the liquid, and prevents the formation of any carbonate of lead.

As the salts contained in the urine tend to decompose the solution, and lessen its effects on the concretion, the bladder should be evacuated, and washed out with tepid water before the lead fluid is introduced. A double-current caoutchouc catheter is the best for this purpose, as it enables a continuous stream to be employed; and as, on account of its flexibility, it is less liable to irritate the urethra, which should be sedulously avoided. From four to eight fluid ounces of the solution may be thrown into the bladder at a time, and renewed every ten or fifteen minutes, as often as may be deemed proper. By renewing the liquid at short intervals, much greater effect on the calculus is ensured, than when it is allowed to remain longer; for the precipitate formed by decomposition soon envelopes the stone, and puts a stop to further action, until a fresh surface is exposed. Exercise during the retention of the injection increases its effect. Some slight revulsion may be produced by the first introduction of this, or any other fluid, into the bladder; when such is the case, the operation should be remitted for a day or two, and cautiously renewed. The injection may be either warm or cold, as may be most

agreeable to the sensations of the patient. Warmth favours the decomposition of the calculus.

If used with proper precautions, I have found that the lead solutions exert as sedative and salutary an influence on the lining membrane of the bladder, as they do on external surfaces under inflammation. They also act upon the mucus, which is so abundantly formed in cases of this nature, coagulating it into short curdy flakes, which are easily passed through the urethra.

When the urethra itself is inflamed, or abraded, the injection will be injurious; for the lining membrane of the canal is, I believe, more sensitive than that of the bladder. The introduction therefore of decomponents should be had recourse to, either before lithotrity, or after the urethra has recovered from the effects of the instruments employed, but can never be used, with any prospect of success, where organic disease of the bladder or prostate exists. The injection should not be employed during the internal exhibition of hydrochloric acid, although it may be freely used when nitric acid is administered. When the bladder is not very irritable, a dilute nitric acid injection, alternating with the lead solution, will hasten decomposition.

The two facts established with respect to the lead salts, viz., first, their toleration by the bladder; and, secondly, their chemical action on calculous concretions, induce me to hope that they may become useful agents in the treatment of various other affections of the urinary organs. I have never presumed to imagine they would prove specific solvents for the stone; but, I trust that, where surgical operation is inadmissible, they will be of some avail for relief, if not for cure, by smoothing asperities, and removing the outward phosphatic coating of calculi, so as to bring them within the verge of the crushing forceps; in short, that they may avail for partial, if not for entire disintegration. The latter is more likely to happen where layers, composed of the urates or oxalates, are bound together by phosphatic cement. On this species of calculus, they are calculated to act as highly carbonated waters do on those of another description.

"Nor is the action of highly carbonated waters," says Dr. Prout, "confined to their mere solvent effects; they undoubtedly possess disintegrating power; that is, the power of disturbing the attraction, both cohesive and adhesive, by which the molecules of the calculi are held together, so as to render them brittle and easily broken into fragments." This is an additional reason for using decomponents before recourse is had to lithotrity.

Besides the kind of cases already adduced, there is one variety for which decomponents seem to be peculiarly adapted: viz., concretions in the prostate gland. No instrument hitherto devised has been successful in dislodging them. The first case, however, mentioned in the present paper, goes to prove that a considerable quantity of calcareous matter was removed from the prostatic portion of the urethra, by the use of the lead injection.

In the first experiment communicated to the Royal Society, it [illegible]ed, that one hundred grains of calculus immersed in lead solution for forty [illegible]utes lost twelve grains. In the second experiment, the quantity dissolved, from [illegible]g-ment weighing thirty-seven grains, was, after half an hour's immersion, eight[illegible]ns. Subsequent experience has verified these observations, and proves that, under favourable circumstances, decomposition takes place in definite proportions; so that, from the precipitate of phosphate of lead, the quantity of ammonio-magnesian phosphate which has been decomposed may be securely estimated.

Since these circumstances obtain out of the bladder, by means of a fluid which can be borne by that organ with impunity, we may reasonably hope, that the mere transference of the scene of action, from the exterior to the interior, will not materially affect the results.—*London Journal of Medicine, October*, 1851, *p.* 890.

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110.—*Acute and Chronic Inflammation of the Bladder.*—Mr. Acton's descriptions and opinions precisely coincide with, indeed are largely taken from, those of the most established writers, and therefore we need not particularize them.

In obstinate cases of chronic cystitis he, however, adopts a method of cure which is certainly not common. "Provided these means fail, and unfortunately failures

the operator, it may lead to the most serious, and even, as we have seen, to fatal consequences.

In a case of double hydrocele—hydrocele of the tunica vaginalis of each side, a question might be raised of the propriety of tapping and injecting both, either at the same time, or the one shortly after the other. From an instance which occurred to me a short time since, I should now decidedly only inject one, with the impression that this single operation might lead to the cure of both. The case to which I refer was admitted into our clinical ward a few months ago, and may probably be remembered by many present. He was in Luke ward, and had hydrocele on both sides, but one was considerably larger than the other; the largest I tapped and injected, and in about a fortnight or three weeks afterwards he was sufficiently well to leave the hospital. I have since heard of him, and both hydroceles have entirely disappeared.

The other operations, as incisions, excision, caustic, seton, and tent, employed for the radical cure of hydrocele, I have already told you I do not now resort to myself, and do not recommend you to do so.—*Med. Times, July* 5, 1851, *p.* 6.

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## 113.—ON THE TREATMENT OF VARICOCELE.

By Dr. JAMES MORTON, Fellow of the Faculty of Physicians and Surgeons of Glasgow.

[The first incentive to lead Dr. Morton to the consideration of the treatment of varicocele, was the remark in Mr. Curling's valuable work on the testis, that varicocele is almost an incurable disease. Subsequent inquiries, however, have satisfied Dr. Morton that the time is approaching for such a reproach against modern surgery to be removed. He remarks:]

When considering the means of palliating this disease, it is necessary to keep constantly in view the anatomical peculiarities of the parts more immediately implicated, such as the origin and course of the arteries and veins, the direction of the excreting ducts, and the media of support to the organ or organs, in this instance the scrotum and cremaster muscle; and also the positions which the contiguous parts occupy in relation to these, and the mechanical or vital effect, if any, which they may exercise upon them. When the circulating system is the seat of the disease, as in this lesion, the course of the vessels supplying the parts with blood, and also that of the venous return, which are usually nearly the same, demand most careful attention; and from a consideration of the course of the spermatic vessels, it is obvious that any circumstance which may tend to produce an accumulation of venous blood in the right side of the heart and vena cava, would predispose to congestion, especially of those organs from which the blood has to return in opposition to the law of gravity; hence, everything which may cause or continue such accumulations ought to be avoided, or, if possible, removed. Everything which of itself causes determination of blood to the testes and scrotum should be shunned, such as warm baths, fatiguing exercise, much indulgence in venery, &c. Gentle aperients, or warm-water enemata, should be employed to obviate costiveness, which always aggravates the malady. A light, loose dress should be worn; the cold-shower bath may be used, as well as frequently dashing the parts with cold water; the cold plunge-bath proved very serviceable as an adjuvant in the case to be detailed; the part should be supported by a suspensory bandage, in order to diminish the length of the vessels, and, consequently, the height and weight of the volume of blood circulating too slowly within them; the bandage should be formed of open silk net, so as not to heat the parts, and to admit of the use of an evaporating lotion at the same time.

Various plans have been proposed in order to make the scrotum itself serve the purpose of a suspensory bandage: such as Mr. Wormauld's, and the operations proposed by Sir A. Cooper and Dr. Lehmann, a German surgeon, all fully described by Mr. Curling in the work already alluded to. Of the various operations proposed or performed upon the veins, I shall merely enumerate the following:—division of these vessels, by Sir B. Brodie; ligature of the same performed by Sir E. Home and Delpech; M. Davat's plan, a sort of twisted suture; M. Vidal's plan of silver wires, twisted subcutaneously; the red-hot wires as used by

Liston; M. Ricord's plan, a form of subcutaneous ligature; and a modification of this, proposed by Mr. Luke; excision of the veins, as practised by Petit and others; and, finally, Breschet's plan of obliterative compression by the forceps. All these (with the exception of the plans of M. Vidal and Mr. Liston, which are not noticed by him) are characterized by Mr. Curling either as ineffectual in removing the disease, or as dangerous both to the integrity of the testicle and the life of the patient; producing atrophy of the former, and endangering the latter by hemorrhage, severe constitutional disturbance, phlebitis, and sloughing of the parts. In severity all these operations are altogether unjustifiable, more especially when we find that another mode of cure has been suggested, which is free from all the dangers above alluded to, is attended with little or no inconvenience in its application, and, when carefully and perseveringly applied, seems to be almost uniformly successful. In proof of this, cases have already been published, and to these I would take the liberty of adding the following.

[Dr. Morton records a case, arising from the effects of a very smart kick upon the scrotum, of a boy, about 14 years old. Although all the symptoms disappeared after a few days, yet a knottiness in the vessels, with an occasional sense of uneasiness or feeling of weakness in the part, remained. This state of things, however, gradually became worse, until, at the age of 27, it was necessary something should be done for his relief. The use of a lever-spring truss was suggested, Dr. L. Thomson, of Dalkeith, having been the first to draw attention to this method of treatment, in a paper published in the 'Monthly Journal of Medical Science,' for November, 1848.]

Dr. Thomson very kindly showed me the mode of applying the lever-spring truss. I at once fitted a similar instrument on my patient, and its immediate effect was such as to inspire him with hope and confidence in at least the palliative powers of the remedy. When applied after the patient had been in the recumbent posture and the tortuous veins had emptied themselves, the power which it seemed to possess in preventing their filling and distension, was to me a matter of surprise, and, I must confess, rather unexpected. On the 9th of January, he first commenced to wear it regularly, but as I was not with him when the truss which had been specially made for him arrived, my patient, being afraid to lose any time, applied it himself as well as he could, and when I saw him two days afterwards, there was a little irritation and swelling of the cutaneous tissues over the pubes and rather below than upon the external ring, where the truss ought to be worn. The impression on his mind seemed to be, that the nearer it could be worn to the tortuous and enlarged veins, the better.

The instrument being properly adjusted, all pain and swelling speedily disappeared, the parts became accustomed to the pressure of the pad, and the veins gradually diminished in size and apparent tortuosity. Notwithstanding the progressive improvement in the condition of the veins, and the assiduous application of cold lotion to the part, the scrotum continued very lax and pendulous on the left side, generally hanging an inch and a half, or even two inches, lower than the testicle: so much was this the case, that at one time I was considering the propriety of having recourse to some operative procedure, such as Sir A. Cooper's operation, or that of Breschet or Lehmann, when it occurred to me that the cold plunge-bath would prove a more efficient bracing agent than the mere local application of a cold lotion, and, besides, I was desirous of testing the contractile powers of the scrotum a little further.

About two months, then, after the first application of the truss, the patient commenced the use of the cold plunge-bath every day, or every second day, as he had opportunity, and by the end of two months more the parts had much improved. It may here be remarked, that the local cold bathing had little effect upon the contractile powers of the scrotum, and that little was very transient, only lasting a few minutes, while the cold plunge-bath produced much greater contraction, which did not entirely disappear for at first two, and afterwards three or four hours after the bath. Under this treatment the improvement of the parts, and, of course, of the patient's feelings, has been all that could be wished, so much so, that he has since married. He still wears the truss.

In the month of September, 1850, I wrote to Dr. Thomson, informing him of the result of this case, and requesting that he would favour me with a detail of

his experience in such cases, subsequently to the publication of the paper already referred to. In reply, he wrote as follows:—

"You ask me to favour you with some remarks on my further experience of the pressure plan of cure since I published on the subject. At present I am unable to give you any detailed statement, but I may mention that, after further trials, I continue, with very slight alterations, to entertain the favourable opinions I then expressed. I have received seven or eight letters, similar to your own, from parties at a distance, who have spoken in the same glowing terms of the relief that has been afforded them by the use of the instrument I recommend. I am only able to lay my hand upon three of these documents at the present moment. The writer of one of them, a perfect martyr to the depressing effects of varicocele, was led to apply to me by the merest accident; namely, by seeing some allusion to my paper in one of the half-yearly Medical Abstracts which he happened to take up, to amuse himself, in his medical attendant's house.* He applied to me in June, 1849, when the varicocele, which he thought had been caused by a '*crush*,' had been of four years' standing."

[The patient afterwards wrote to Dr. Thomson, stating, that although great inconvenience and pain resulted at first from the employment of the instrument, yet that now the parts were assuming a natural healthy feel and appearance,—and, he believed, that in the time specified, nine or ten months, a complete cure would be established. Dr. Thomson goes on to say]

"With the exception of one case, I am not sure whether the truss has altogether been discontinued in any, for, as soon as complete relief is experienced, I hear nothing more from my patients. This is partly owing to my own negligence in correspondence, but more, perhaps, owing to the reluctance patients have in giving up the use of that which has been of so much service to them. For some time after discontinuing the use of the truss there is felt the want of its *support*, which, in those who have to undergo much muscular exertion, is apt to make them take to it again, though in reality not requiring it. I find, however, that even in a young subject, considerably longer than nine or ten months may be necessary to produce a radical cure."

It must be admitted that the proposal of applying a truss in cases of varicocele is opposed to our preconceived notions; taught as we have been, in works on hernia, carefully to distinguish between protrusion of the bowel and dilatation of the spermatic veins; and, on no account, to think of applying a truss to the latter class of cases; such a procedure being calculated to result only in a mischievous aggravation of the disease. But against these notions we have here the stern verdict of experience, and we are constrained to look around for some principle by which to explain the *modus operandi* of the agent we employ.

It is by a process of analogical reasoning that we have arrived at a knowledge of this method of treatment, for the history of which, and an account of the principle upon which it is founded, I must refer to the work of Mr. Curling. The merit of suggesting the application of pressure to varicocele seems to belong to the late Mr. Aston Key. The object of it may be stated to be the maintenance, while the patient is in the upright position, of pressure upon the spermatic veins, to such a degree as may be sufficient to relieve them from the superincumbent weight of the blood, without endangering the integrity of the testis by obstructing the spermatic artery, or becoming unbearable by the patient. This pressure must be continued for a time sufficient to allow the coats of the veins to return to their natural dimensions, or nearly so, and until they acquire strength to carry on the circulation. It may be supposed, that the valves incompetent for the dilated canal may become adequate to the discharge of their healthy functions when the calibre of the vein is diminished by compression. In one of the cases mentioned by Dr. Thomson, the commencement of the malady is referred to a crush: my patient referred his to a kick; it is possible, then, nay, it is probable, that the determination of the blood to the parts, consequent upon the injury inflicted, may have caused some dilatation of the canals of return, sufficient in amount to render the valves unequal to their duty; which circumstance would not only perpetuate the

* See 'Retrospect,' vol. xviii. p. 259.

dilatation, but would allow the weight of the column of blood in these vessels to operate continually as a means of gradually increasing the evil.

As the treatment of varicocele by pressure brings us into direct contact with the instructions usually given for effecting a diagnosis between this morbid state and a hernial lesion, it may be necessary to refer to these directions, or rather to those circumstances which are really worthy of reliance. They are not numerous, as only four points seem deserving of careful attention and some degree of trust, individually, while collectively they may serve to establish our diagnosis. These are, first, the history of the case, not always obtainable from an intelligent source; second, the peculiar feel of the scrotum, compared, as it has been in varicocele, to a bag of earth-worms, as differing from the smoothly rounded swelling of a hernial protrusion; third, the sensation communicated by pinching up the parts at the ring, and rubbing them between the finger and the thumb; and, fourth, the mode of return of the swelling when completely reduced, whether from above, as in hernia, or from below, as in varicocele. It is now known that moderately firm pressure prevents the return of both. That any well-educated surgeon, after a careful examination, can mistake the one malady for the other, is hardly conceivable; but should they occur together in any case, the hernial protrusion being small, it is possible that the latter may be overlooked by the surgeon, the mass of enlarged veins attracting all his attention, and at once deciding his diagnosis. Should this, however, be accompanied by strangulation and the symptoms usual in such a case, the surgeon will then be led to look deeper for the cause of the more urgent symptoms. To those who are interested on this point I would recommend a perusal of Dr. Thomson's paper, already cited, more especially as the case detailed by him, and the remarks which follow it, bear particularly on the mode of diagnosing between these two morbid states.

As might have been predicted, some have been afraid to employ the truss, through a fear of rendering matters worse, but Mr. Curling has stated, that among all the cases of hernia which he has seen, in which a truss has been worn for a length of time, he has not met with one, and cannot recollect one complicated by varicocele. It may be that the one lesion acts as a prophylactic to the other, even where a truss has not been worn, by each so filling up the inguinal opening as to prevent the descent of the bowel in the one case, and the dilatation of the veins in the other. However this may be, it cannot be denied that the author of the above statement has enjoyed large opportunities of seeing and examining such cases.

The objections to this mode of treatment are few, if indeed there are any worthy of attention. Mr. Curling lays much stress on the pain and inconvenience caused by the instrument, and instances two cases in which the patient had been obliged to discontinue the wearing of the truss; and Professor Syme also stated that he thought the remedy worse than the disease.

In the cases treated by Dr. Thomson, we find that very little is said of the annoyance or suffering produced by the instrument; in none of them has it been severe, or even protracted, and it was exceedingly trifling in the case under my charge, and did not last longer than two or three days; so that I am disposed to regard this objection as deserving of little consideration, and referable, in all probability, to the imperfection or unfitness of the instruments employed in the cases which have been adduced.

Again, it has been said, that the pressure must be so firm as to be intolerable; but it may be safely affirmed, that a degree of pressure which becomes unbearable must be greater than is required for the object we have in view; and, laying the question of toleration of the instrument aside, it ought to be discontinued, because it may endanger the integrity of the testis, the preservation of which is one of the desiderata, and the chief merit of this mode of treatment. It is indeed very probable that a truss with a very powerful *circular spring* might operate as powerfully in producing rapid atrophy of the testis, as any of the *obstructive* operative measures which have been already named, a result not unfrequently observed in hernial patients, where a very strong truss has been long worn over the external abdominal ring. The truss should be so constructed that the degree of pressure can be regulated by the surgeon or by the patient himself; and such is the nature of the instruments used in the preceding cases, and here recommended. It may

also be laid down as a general rule, that a degree of pressure, firm enough to prove effective as a curative agent, will not be difficult to bear. Should we meet with exceptions to this, it has been recommended, that such patients should at first wear an instrument of less power, to be followed by a more powerful one, when it can be borne.

All modes of operative interference hitherto proposed have been utterly discountenanced by the highest living authorities in surgery, so that we are confined to this remedy or to none: either to abandon these cases as incurable, or try some such method of relief. The advantages of the treatment by pressure are numerous; such as, an avoidance of confinement to bed, house, or even absence from business, and consequent concealment, for few patients so affected will be desirous of making their malady known to any except their medical attendant: there is no danger to life; no wound is inflicted, hence no risk of inflammation of veins, of sloughing, of hemorrhage, or any other of the occasional dangers inseparable from cutting operations, among which erysipelas is not the least formidable. The wearing of the truss is also quite compatible with the continued use of all the usual palliative measures with the addition of the cold plunge-bath, which ought not to be neglected.

The time during which it is necessary to wear the truss has been stated to range from nine to fifteen months, and some cases may require a longer period; but time is of little consequence, since the patient is not confined to the house, or in any way prevented from attending to business.

Doubtless, cases of disease do occur, so complicated that all remedies are found to fail, and there may also be cases of varicocele so complicated with other forms of disease, that the application of a truss may either be inadmissible or inadequate to effect a cure; and, while it is improper to draw inferences from such a limited number of cases as I have been able to collect, upon which to pin our faith dogmatically; still, I may be allowed to give it as my decided opinion, that the treatment by pressure is the only course we ought to adopt; that a trial of it should be recommended in every complicated case; that it is free from danger; not difficult to bear; and will be found sufficient for the cure of almost all cases of varicocele.—*Dublin Quarterly Journal of Medical Science, November*, 1851, *p.* 319.

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114.—*On Spermatorrhœa.*—[In Mr. Acton's work no allusion is made to the use of cold hip-baths in this affection, though it forms the chief means employed by an advertising practitioner in the metropolis, who has the reputation of being more successful in this particular affection than any of his notorious brethren of the 'Manhood,' and 'Silent Friend' school. The Reviewer observes]

We have seen or heard of many cases in which these baths proved of undoubted and very great advantage. The patient begins by sitting in a hip-bath, the sitz-bath of Priessnitz, for five minutes three times a day, the water being brought to the temperature of 65°. The time is gradually increased and the temperature lowered, until the patient sits for twenty minutes, three times a day, in water at 50°. In some cases, the spine is sponged for three or four minutes before leaving the bath, and very often a shower-bath is used after the first daily sitting-bath, the head being protected by a conical cap. Gentle exercise for five minutes before, and half an hour after, each of these processes is ordered. From what we have seen of the results of the treatment, we shall always be inclined to adopt it, before cauterising the urethra or following any other plan of treatment which may be hazardous. We have seen some cases of persons whose powers had been debilitated by long residence in hot climates, where the effect was very speedy and remarkable; and we have been informed, on credible authority, that the fecundating power of married men, whose generative energy was in other respects unimpaired, has been evidently restored by a few weeks' course of these baths.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 190.

## 115.—THE ANATOMY AND DISEASES OF THE PROSTATE GLAND.

By JOHN ADAMS, Esq., Surgeon to the London Hospital.

[Mr. Adams illustrates a case of acute prostatitis as follows:—A young man, of irritable constitution, contracts gonorrhœa. He employs strong injections at an improper stage of the disease, pursuing at the same time his former mode of life. The result is an increase in the inflammation, which now extends to the prostatic part of the urethra, and the neck of the bladder, inducing distressing symptoms, and, if not checked, involving the prostate gland itself.]

There is one point of considerable practical importance connected with chronic prostatitis to which Mr. Adams draws particular attention; it is the frequent implication of the prostate gland in cases of long-continued gleet, and he considers that, in many instances, the discharge is entirely due to an increased and altered secretion of the follicles of the gland. He shows, very properly, the inutility of employing injections in cases of gleet depending upon the cause now mentioned, and extols Chian turpentine as possessing quite a magic influence over it, which circumstance he attributes to its exercising a specific action upon the prostatic part of the urethra, and on the prostate gland itself. We have found Chian turpentine of marked benefit in urethral discharges of various kinds, as well in the sub-acute stages of gonorrhœa as in that form of gleet dependent upon irritation of the prostate gland; but we cannot say that it displays as much power over the latter disease as the author's remarks would lead us to suppose. The medicine is of uncertain efficacy in all cases for which it is employed, and will rarely, according to our experience, exhibit its curative effects "instantly" in any.

Mr. Adams next touches upon "prostatitis from onanism," a subject as important as it is delicate, and, from being culpably overlooked by those who study their profession scientifically, has come almost entirely within the domain of the ignorant empiric. To Lallemand the profession is certainly indebted for the light which his careful investigation of cases has thrown upon this important subject; but his views, upon the whole, are very partial, and he has left considerable room for further practical information. The author draws an important line of distinction between spermatorrhœa the result of chronic prostatitis, and that, the consequence of an irritable state of the prostatic part of the urethra induced by the disgusting practice of onanism; and it is of much moment to attend to this point of distinction, as the treatment of the two cases materially differs. No doubt prostatitis is, as Mr. Adams remarks, frequently attributable to onanism; but if we are to cure the spermatorrhœa we must remove the inflammation of the organ.

When frequent involuntary emissions are the result of an irritable condition of the prostatic part of the urethra, there is no plan we have found so effectual as the occasional introduction of a bougie. Very often the state of the urethra is more than that of irritation, for it amounts to chronic inflammation. In such cases if we employ a moderate-sized instrument we shall often experience some resistance just as the bougie arrives at the prostate gland, such as would be produced by a thick fold of the membrane; the patient, too, at this part of the operation, starts with pain, which in some instances is described as sickening, being followed by faintishness and a tendency to nausea. If there be no obstruction we should at once apply the nitrate of silver to the prostatic part of the urethra; if there be, the probability is that the use of the bougie will, *per se*, remove the irritable state of the canal, and thus cure the emissions. Under any circumstances the caustic can be employed with greater ease after the obstruction has been overcome. In addition, Mr. Adams recommends the administration of conium, and the use of cold water injections per rectum, and judiciously alludes to the great necessity that exists for observing moral treatment.

But of the various diseases of the prostate gland the most important for the study of the surgeon is the senile enlargement, or hypertrophy of the organ, because it is so common in occurrence, and because the consequences to which it leads so frequently demand his promptest assistance. Though it is an affection well known to be beyond curative treatment, still it can, by proper measures, be greatly retarded in its progress, and its symptoms, when urgent, be mitigated.

The author gives a systematic, but perhaps too brief and superficial account of

the symptoms, morbid anatomy, etiology, and treatment of this affection; still, many of his observations exhibit a sound, practical knowledge of the subject. After marking the different alterations in the character of the urine, corresponding with the different stages of prostatic disease, he alludes to the pathological changes in the state of the bladder. For the varying capacity of that viscus in cases of enlarged prostate he attempts to offer what he conceives to be a plausible reason, viz., that when it is contracted in size there has been inflammation of the prostate extending to the bladder, whereas when it is enlarged, that this condition is not found to exist. It occurs to us that this supposition is not at all necessary to account for the pathological condition to which we allude, for whether the bladder be diminished or increased in capacity must depend upon whether the prostate gland is so circumstanced as to act as a foreign body continually keeping up irritation, or to offer such effectual resistance to the escape of the urine that there must be a permanent state of distension of the organ. In some instances, where there is not the slightest indication of the presence of inflammation, the irritability of the bladder is so great that the individual cannot retain his urine for fifteen minutes consecutively without experiencing great pain and distress, while there are other cases in which the existence of inflammation is unquestionable, but where a distended bladder, coinciding with retention of urine, is the condition present.

Mr. Adams draws especial attention to what has been termed "the fluttering blow of the bladder," and urges the necessity of attending to the nature of this phenomenon, so as to avoid mistaking it for the evidence of stone in the bladder. We have at present a gentleman under our care for enlarged prostate, in whom the phenomenon is most remarkably distinct, and who might most readily be considered to be the subject of calculus in the bladder. Upon introducing a catheter, which passes with ease, and drawing off nearly all the urine, two sudden, abrupt taps are distinctly felt against the extremity of the instrument, then, upon withdrawing it for a short distance, just as the remainder of the urine is expelled, the same sensation is again communicated to the hand. We have no doubt that in this case a vesical pouch or pouches exist, which are the causes of the peculiarity mentioned.

There is no pathological change which has baffled more completely a rational conjecture as to its cause than hypertrophy of the prostate gland, because the nature of the change is contrary to analogy in all other respects. When the animal machine is fast declining, when in all other parts and organs nutrition no longer counterbalances decay, and in some complete atrophy exists, it is then the prostate gland exhibits a perfectly opposite tendency, and passes into a state of hypertrophy. Mr. Adams leans to the idea that the cause of this remarkable change may be found in the venous congestion which is generally met with around the prostate at the middle period of life, but we cannot think that this explanation is in the least satisfactory; and indeed we conceive that if venous congestion holds any necessary relation to enlarged prostate gland, it is rather the effect than the cause of the hypertrophy.

As regards the treatment of hypertrophy of the prostate gland, we believe the great secret in giving relief, and delaying the progress of the disease, consists in the regular and judicious employment of the catheter. The affection seldom lasts for any time without preventing the complete evacuation of the contents of the bladder; every time the patient makes water some fluid remains behind. The circumstance soon leads to inflammation of the mucous membrane of the bladder, and it is then that the urgent and distressing symptoms belonging to the disease occur. Now, when the urine is regularly and completely evacuated by artificial means, these latter symptoms will be found to be greatly postponed. In giving his preference to the horizontal posture for the introduction of catheters, Mr. Adams assigns the following reason. He says:

"Where the third lobe is much enlarged, and constitutes the cause of retention, when the patient is erect it falls forward, and, impinging upon the apex of the catheter, prevents the instrument from passing into the bladder; whereas, if the patient be laid on his back, the third lobe falls backwards, and the instrument glides freely onwards without impediment."

We do not exactly understand this explanation. If Mr. Adams means by the

phrase "falling forwards and backwards" that the middle lobe is sometimes pendulous, his statement is perfectly correct; but we cannot understand how position can materially affect it, for, even allowing that the lobe falls forward when the individual stands in the erect posture, its very pendulousness would prevent its offering any effectual resistance to a catheter such as is usually employed in prostatic cases. On the other hand, if he means that the direction of the prostatic part of the urethra is influenced by position, then we fully coincide in his view. Every surgeon must have observed, that in many cases besides those of enlarged prostate—in strictures situated in the prostatic part of the urethra and in obstructions at the neck of the bladder—attention must be paid to position, to succeed in introducing an instrument. The direction of the canal differs greatly in the horizontal and the erect posture, and, as we cannot ascertain beforehand the exact alteration which the morbid lesion has produced upon the canal, so as to determine which position to observe, it is better, as Mr. Adams remarks, always to attempt the introduction of the instrument first in the horizontal posture, and, if we fail in our attempt, then to resort to the experiment of placing the patient in the standing position.*

## DISEASES OF THE EYE AND EAR.

### 116.—HERNIA OF THE IRIS; RAPID RETRACTION BY THE USE OF ATROPINE ON BOTH EYES.

The 'Philadelphia Medical Examiner' mentions a case of wound of the cornea, under the care of Mr. Morehouse, where the iris was herniated. Attempts at reduction were made by touching the prolapsed iris with a solution of atropine, (five grains to the ounce of distilled water,) but with little result. Mr. Morehouse then thought of taking advantage of the consentaneous action of the two irides, and applied the solution to both eyes. This method succeeded at once, the iris retreated, and the wound of the cornea soon healed up.—*Lancet, Aug.* 9, 1851, *p.* 131.

117.—*On a New Method of Treating certain Cases of Epiphora.*—By WILLIAM BOWMAN, Esq., F.R.S. [This treatment applies to those cases which depend on a displacement of the puncta lachrymalia out of the course of the tears, or on an obstruction of the canaliculi between the punctum and caruncle, the inner extremity of the canals, together with the lachrymal sac and nasal duct, remaining healthy.

The author describes the exact nature of these cases, and relates examples. The treatment which he has devised consists in slitting up the canal from the punctum on the conjunctival aspect, so as to carry backwards the orifice at which the tears are received on to the mucous membrane near the caruncle; and he finds that the tears are, in fact, taken up by the remaining portion of the canal, while the end towards the punctum is converted into a groove. For the cases of obstruction from injury or other cause, he suggests a modification of this operation, by which the canal between the obstruction and the sac may be slit up for some way so as to receive the tears at a new opening.

The cases to which these new operations are applicable have been for the most part abandoned by surgeons as incurable.—*Med. Gazette, July* 11, 1851, *p.* 78.

118.—*The Eye Fountain.*—This is a new invention, by Mr. W. B. PINE, of the Strand, and will be found of great use by persons afflicted with weak or inflamed eyes; also after a long study. It is in shape like a small vase, attached to which is a small air-pump, the use of which is to propel, through a very fine jet, a continuous stream of water or lotion against the eyes. We have much pleasure in

* From a Review of Mr. Adams's work on the Prostate Gland in the 'Dublin Quarterly Journal,' Nov. 1851, 465.

recommending this instrument to the notice of the Medical Profession and others as a great improvement on the old method of applying lotions. We would also remind our readers, that the German oculists have for many years used a long tube for the same purpose, and with good effect to the patient.—*Med. Times, July* 12, 1851, *p.* 55.

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119.—*Deafness Successfully Treated by Vibratory or Musical Sounds.*—By Dr. A. TURNBULL.—[Dr. Turnbull imagines that the greater number of cases of deafness arise from the torpidity of the auditory nerves from exposure of the tympanum to the cold of the atmosphere. Even when a healthy ceruminous secretion has been induced after wax has been removed from the ear, there often remains an imperfection of hearing, a sort of muffling accompanied by most distressing sounds.]

This (says Dr. Turnbull) led me to institute various trials to remove this morbid condition; and I am now enabled to state that the hearing may be perfectly restored by introducing into one ear an Æolian pitch-pipe, or other properly adapted musical instrument, and continuing the vibrations within the ear for the space of five or ten minutes daily. At the same time, and during this process, the opposite ear must be well closed. It will then be necessary to proceed in a similar manner with the other ear. This plan of treatment ought to be continued for a week or two after the patient's recovery, and ought to be left off with the lowest note. It may be well to state that no good effects can be derived from this method unless the vibrations be confined chiefly within the ear, so to localise their effects.

It is right also to presume that the vibratory mode of treatment will fail to be permanent in its effects unless the healthy secretions be first restored. The cases in which success is greatest are those in which the ticking of a watch can be heard when pressed upon the temple bones, and those in which hearing is temporarily increased during the bustle and noise that prevail more or less in the open air, or in carriages, or railway travelling, as long as the vibration is kept up. This plan of treatment generally removes disagreeable noises in the ears and head in chronic and nervous deafness.—*Med. Gazette, June* 6, 1851, *p.* 1010.

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## DISEASES OF THE SKIN.

### 120.—ON THE TREATMENT OF ERYSIPELAS BY THE MURIATED TINCTURE OF IRON.

By G. HAMILTON BELL, Esq., Edinburgh.

[Mr. Bell describes a mode of treating this disease which he has employed for upwards of a quarter of a century, without failing in one single instance. In no instance, by its employment, has suppuration taken place, and the patient he states to be generally left in a more robust state of health than he was previously.]

*Mode of administering the remedy.*—Of course the first object is to have the bowels freely acted on. If the erysipelas be mild, fifteen drops of the muriated tincture of iron are administered in water every two hours until the disease is completely removed. When the attack threatens to be more severe, the dose of the tincture is increased to twenty-five drops every two hours, and persevered in night and day, however high the fever and delirium. The only local applications I ever find necessary are hair powder and cotton wadding. While I depend for the removal of the disease on the chalybeate, it is necessary that the bowels should be attended to throughout the treatment.

*Cases.*—I. 25th Dec., 1832.—Mrs. Naughton, a poor woman, about 60 years of age, of broken constitution, and having what is vulgarly called "shaking palsy"—a state of continuous chorea—had been suffering from erysipelas some days, and I was called to see her late at night. I found her head entirely covered with ery-

sipelas; she was in a state of great exhaustion, and delirious. Ten drops of the muriated tincture of iron were ordered to be taken every two hours. On the 26th she was calm and appeared easier; cont. tinct. 27th.—Quite collected, inflammation and swelling decreasing; cont. tinct.; to have a dose of oil. 28th.—Inflammation rapidly disappearing; nourishing diet; continue drops. 30th.—Recovering fast; *perge*. 2nd January.—Erysipelas gone, and the poor woman wonderfully well.

II. 20th May, 1835.—I was called to the Waterloo Hotel, at one o'clock p.m., to see R. R., Esq., a stout gentleman, of full habit, about 30 years of age. I found him suffering from excruciating pain in the soles of the feet, which he ascribed to cold he had caught the previous day in coming from Glasgow. The pain was so acute that he could not bear the weight of the bed-clothes, nor his feet to be touched in the gentlest manner. Tongue loaded; pulse irregular, but not accelerated: skin of natural temperature, except on the feet. Eighteen leeches were applied, and he had six grains of calomel, followed in three hours by a dose of the compound powder of jalap.

*Vespere.*—Pain of feet relieved, but there is excessive prostration of strength. Tongue still loaded; thirst; pulse irregular and unsatisfactory. The medicines had acted freely, and brought away a quantity of dark coloured offensive scybalous matter. Slight erysipelatous blush on the right ankle. The following medicines to be given immediately:—calomel, five grains; henbane, six grains; opium, one grain; James's powder, three grains; in the form of pills.

21st.—Slept well; pain of feet much diminished; right ankle swelled and red; complains of pain behind the knee; much thirst; skin natural; pulse 120, irregular; the evacuations from the bowels black, watery, and offensive. A table-spoonful of a mixture containing one part of the spirit of Mindererus and two of camphor mixture, to be given every two hours. Hair powder and cotton wadding to be applied to the feet and ankles. 2 p.m. No improvement; spots of erysipelas at the roots of the toes and over the instep, extending [redacted]e ankles. In consultation with Dr. Abercrombie, the following medicine was ordered:—Half a drachm of the compound powder of jalap and ten grains of [redacted]ubarb. The camphor and sp. Mindereri to be continued. 5 p.m.—No improvement; pulse 130. 8 p.m.—Dr. Abercrombie again saw him. Erysipelas rising o[redacted]e leg; vesicles on the instep; tongue much loaded; stools black and unwhole[redacted]; prostration continuous. I explained to Dr. Abercrombie my mode of treating erysipelas, and obtained his assent to the exhibition of the muriated tincture of iron,—twenty drops were ordered to be given every two hours. A colocynth pill to be taken at bed time. *Midnight.*—Bowels freely moved; two doses of the tincture of iron had been taken; pulse 100, fuller and more regular; skin hot. The colocynth pills not to be taken until morning. Cont. tinct.

22d, 8 a.m.—A sleepless night; suffering much from rheumatism in right arm; less pain in the soles of the feet; erysipelas not extending; pulse 100, full and soft; bowels not open; to have the colocynth pills. *Noon.*—With Dr. Abercrombie. Tongue clearer; skin soft; erysipelas diminishing; rheumatism very severe in right arm. To continue the iron, and to have forty drops of colchicum wine three times a day. 7 p.m.—With Dr. Abercrombie. The symptoms more satisfactory; perspiring; *perge*. The improvement continued, and on the 25th the erysipelas had entirely disappeared. The rheumatism was more obstinate, but Mr. R. returned home in perfect health on the 6th June.

I have seldom seen more alarming exhaustion than appeared in this case for the first six-and-thirty hours after the attack.

III. 6th March, 1841. Mrs. W., æt. about 40, of full habit, complains of having a painful boil above the ear; there is also a patch of erysipelatous inflammation extending over the cheek; the ear much swollen. To have fifteen drops of the muriated tincture of iron every three hours; hair powder to be applied to the inflamed surface.

7th.—Boil better, but erysipelas extending all over the side of the face. To continue the steel drops.

8th.—Erysipelas subsiding. To have an aperient; cont. tinct.

12th.—Patient well.

IV. 7th July, 1843.—Mr. A. W., æt. 16, a stout youth, of florid complexion,

attacked with fever and headache. Ordered a dose of calomel and antimonial powder, to be followed by a black draught.

8th.—Erysipelas appeared over side of the face, with much fever; bowels free. To have ten drops of the muriated tincture of iron every two hours.

9th.—Less fever; erysipelas arrested; cont. med.

10th.—Disease stationary. The tincture to be increased to twenty drops every two hours.

12th.—Considerable improvement.

15th.—Erysipelas gone.

V. 10th December, 1845.—R. S. W., Esq., æt. 50, a delicate man, having had his constitutional strength injured by an accident in early life. I was called to the country to see him, and found him suffering a severe attack of erysipelas on the right side of the head; ear much swollen; pulse 100 and throbbing; great thirst; tongue furred; slight confusion of head; bowels open by medicine. Fifteen drops of the muriated tincture of iron to be taken every three hours.

11th.—Very ill; erysipelas extending; severe headache; troublesome dry cough. The chalybeate tincture to be continued; to have a cough mixture and effervescing draughts.

12th.—Less confusion of ideas in the morning, but erysipelas extending all over the face, which was much swollen.

*Vespere.*—Very restless. To have half a drachm of the solution of morphia in an ounce of camphor mixture at bed-time; the tincture continued.

13th.—Erysipelas extending, covering nearly the whole head and face. Had not taken the drops regularly; bowels free; the drops resumed.

14th.—No improvement; the head an inflamed mass, and much swollen; takes nothing but water; cough troublesome; mind wandering. To continue the tincture, and to have an aperient.

*Vespere.*—A diminution of the inflammation, and swelling of the side of the head first affected.

16th.—No amendment; left side of the head tremendously swollen; very incoherent all day. I remained with my patient during the night, and induced him to take the drops regularly.

17th.—A most satisfactory change; quite coherent; pain and swelling of face diminished, although [illegible] a mass of dried exudation. To have an aperient, and continue the tincture.

18th.—Watched and administered the drops during the night, and to-day there is a wonderful improvement in all his symptoms. To continue the medicine.

21st.—Doing well.

1st January.—Has had no interruption to his convalescence, and feels in better health than before his illness.

There was probably from the state of the patient's mind, much irregularity in the administering the steel drops until I personally watched the case; and, on the 16th, the disease had assumed a very alarming appearance; bnt immediately upon the medicine being regularly given, so as to bring the system thoroughly under its influence, a most satisfactory change was produced in the symptoms; the fever and delirium and pain subsided, calm sleep was induced, and the inflammation gradually disappeared.

VI. 16th January, 1850.—Miss C. M. seized with pain, inflammation, and swelling, extending over both cheeks and nose. Pulse 100; tongue loaded. A dose of calomel and James's powder ordered to be given at bed-time, to be followed in the morning by hourly doses of the solution of Epsom salts and tart. emetic, until the bowels should be freely moved.

17th.—Face more swelled and inflamed; pulse 80; tongue cleaner. To have fifteen drops of the muriated tincture of iron every three hours; hair powder to be applied to the inflamed surface.

18th.—Face less painful. To continue the drops regularly, and to have an aperient.

19th.—Face entirely encrusted with exudation, having very much the appearance of the advanced stage of confluent small-pox; erysipelas not extending; no fever; tongue clean, but much annoyance from cough. To have a cough mixture, and continue the drops. 20th.—Improving. 21st.—Doing well.

22d.—So much better as to be in the drawing room. The disease happily left no sort of mark on a face of much beauty.

VII. 1st November, 1850.—W. C., Esq., æt. 73, had been suffering from severe catarrh and cough for some days. Felt yesterday as if his shoes were too tight for the left foot, and on going to bed the ball of great toe became agonizingly painful; no sleep nor ease in any posture. Ball of toe is much swelled and tender to the touch, having all the character of gout, but the inflammation is erysipelatous, extending over the front of the foot. Pulse 60, irregular; bowels open from medicine; tongue clean. Fifteen drops of the muriated tincture of iron to be taken every three hours.

*Vespere.*—Mr. C. declares that the drops acted like a charm, and at once relieved him from the pain. Redness and swelling continue. To have an aperient, and continue the drops.

2nd.—Scarcely any pain, although the inflammation is extending. A troublesome cough. The dose of the tincture to be increased to twenty-five drops. To have paregoric for the cough.

3rd.—Inflammation spreading towards instep. To have an aperient pill, and morphia lozenges for the cough. Continue the drops.

4th. Inflammation fading.

5th.—Improving.

8th.—Able to go out of doors.

I have in my journal several cases in which erysipelas was combined with gout. Two of these occurred in gouty subjects, and in both the health was restored by the chalybeate, as in the above case of Mr. C. This gentleman had, two years ago, an attack of erysipelas in his thigh, and was cured by the steel drops. He never had gout before, but I understand his father had suffered from it.

With regard to the diet of the patient under erysipelas, unless when there is much fever, I always recommend it to be generous, and of easy digestion. In a case at present convalescent, in which the attack was very similar to Mr. C.'s, only that while the great toe and foot were violently inflamed, the knee of the other leg was also affected, from the habits of the patient—a constitution broken from intemperance—I was obliged to allow, along with the drops, nearly a bottle of port a-day. In this case the podagral erysipelas has disappeared, and my patient is in better health than he has had for several months.

[Dr. CHARLES BELL, brother of Mr. G. H. Bell, adds a few remarks with cases. He says:]

The beneficial effects of this medicine are so immediate and invariable in the common forms of erysipelas, that I feel convinced were it given with boldness and perseverance in puerperal fever, which is now generally admitted to be analogous in its nature, and frequently accompanied by erysipelatous inflammation on the surface of the body, many valuable lives might be preserved.

In pursuing the chalybeate treatment of erysipelas, I consider it of much importance to bring the system rapidly under its influence, in order to effect a speedy removal of the disease. I have therefore been in the habit recently of giving much larger doses of the tincture than I ventured to prescribe at first. It is a remarkable circumstance in the exhibition of this valuable remedy in the erysipelatous diathesis, that although given in much larger and more frequently-repeated doses, than have been recommended in our dispensatories, it never produces headache, and when this symptom is present it quickly relieves it; at the same time, it reduces and regulates the pulse: thus showing that in this state of the system, it has a soothing and sedative, as well as alterative effect.

The cases above related prove so clearly the remarkable influence which this medicine has in overcoming the idiopathic form of erysipelas in the adult, that I consider it almost unnecessary to increase the length of this paper by producing additional evidence on the subject, although I have had many cases illustrating the fact in my own practice. I am more anxious to direct attention to the advantages to be derived from this mode of treatment in *infantile erysipelas*, in which the field for curative measures is so very limited; and also to its effects in that form of the disease consequent on external injury, in which the best treatment has hitherto been too often unavailing, especially in our hospitals, and after operations. With

this view, I shall now briefly relate a few cases illustrative of the treatment in each of these forms of erysipelas.

On the 27th March, 1849, I was requested to see Mrs. Munro's baby, of a few weeks old, which was suffering from a severe attack of erysipelas, extending from the wrist to the elbow. I ordered it to have a dose of castor oil immediately, and two drops of the tincture of the muriate of iron, to be given every two hours in a teaspoonful of water, with a little sugar. In three days, the erysipelas had entirely disappeared, and the infant seemed lively and in good health.

Mrs. M.'s baby, an extremely emaciated infant, born on the 24th Jan., 1850, was seized a few days after birth with erysipelas, which occupied the vulva and nates, and was accompanied by severe catarrh and cough. There were much fulness and tension of the lower part of the abdomen, the urine was retained, and the bladder could be felt like a small orange immediately above the pubes. Being naturally weak, it soon became so excessively feeble that no hopes were entertained of its life being preserved, and it was deemed advisable to have it christened without delay.

Small doses of calomel and James's powder were given at short intervals, along with a cough mixture composed of ipecacuan wine, carbonate of soda, water, and syrup. Very little benefit seemed to arise from this treatment; I therefore stopped the calomel and antimony, and ordered two drops of the tincture of the muriate of iron to be given every two hours in a little sugar and water. The infant had become so exhausted, that I was obliged for some time to order, in addition to the tincture, a drop of brandy to be given every half hour.

Under this treatment, the erysipelas and dysuria rapidly disappeared, and the infant slowly gained strength, and is now a lively and healthy child.

Mrs. C.'s baby, a fine, healthy looking infant, was born on the 27th September, 1850, with six fingers on each hand. A few days after birth, erysipelas appeared on the vulva and nates, accompanied with a disordered state of the bowels and frequent green evacuations. Having endeavoured for some time to correct this state of the bowels with small doses of grey powder, rhubarb, and the carbonate of soda, and occasional doses of castor oil, without effect, I ordered two drops of the tincture of the muriate of iron to be given every two hours in a little water and sugar. For some time little progress, however, was made in removing the erysipelas. One day it seemed to subside, and on the subsequent day it was as bad as ever. I was induced to believe that the medicine was not given regularly, and that some days it was not given at all. There was reason also to suspect that the nurse's milk was bad, and I was informed that her own child had been affected in the same manner. I recommended that another nurse should be got, and insisted on the muriated tincture being given regularly. The result was that the erysipelas was removed, and the child's health so much improved, that Mr. Syme was enabled, within ten weeks after its birth, to remove the supernumerary fingers with success.

I shall now give a few cases of *sympathetic erysipelas*, or that consequent on external injury. Mrs. D., of broken constitution, received an injury on her nose, which slightly abraded the skin. Erysipelas of the upper part of the face soon followed. She was put on the tincture of the muriate of iron, and in three days the disease was entirely removed.

3rd September, 1850.—I was requested to see Mr. Thomas Ewart, railway guard, who was said to have met with a serious accident. I found him suffering under phlegmonous erysipelas, extending from the ankle to the knee,—the consequence of a slight bruise he received on his shin about a fortnight previously, and which he had neglected. The usual treatment was adopted, viz., evaporating lotions, poultices, and incisions, along with internal medicines, such as calomel and antimony, with saline draughts; but with no improvement in the leg,—there being much swelling and inflammation, and the wounds had a dry and unhealthy look. For some days I had great fears that the patient would sink under the disease; and my apprehensions of his ultimate recovery were much increased when erysipelatous inflammation appeared above the knee and extended to the hip, occupying the whole of the posterior part of the thigh. There was a considerable degree of fever, pulse 110, flushed face, headache, and severe cough.

Twenty-five drops of the tincture of the muriate of iron were ordered to be given in water every two hours, along with a diaphoretic mixture, containing the solution of the acetate of ammonia and antimonial wine. The bowels were kept open by saline medicines.

The headache and fever soon subsided, and the erysipelas disappeared from the thigh. The leg healed slowly, in consequence of the extensive sloughs which formed round the incisions, and the luxuriant granulations which afterwards formed requiring the frequent application of escharotics. The man ultimately made a good recovery, and returned to his duty in better health than he had enjoyed for a length of time before his accident. I have no doubt, had the chalybeate tincture been given at an earlier period in this case, the disease would have been checked in its commencement, and no sloughing would have taken place. I am the more convinced of this from the result of the following case.

On the 4th December, 1850, I was called a few miles into the country to see Mr. T.'s son, aged about four years. He had always been paralytic in his right leg, in consequence of an accident it was supposed he had met with when an infant. For some time previous to my seeing him he had suffered from a painful swelling on the right side of the anus, which suppurated, and was opened by the family surgeon, and a large quantity of pus discharged; but the abscess showed no tendency to heal. While playing on the carpet, he slightly bruised the skin of his left leg under the knee, which was immediately followed by erysipelas extending from the knee to the ankle, and accompanied by high fever and rapid pulse.

Small doses of calomel and antimonial powder were ordered to be given every three hours during the day, and a dose of the essence of senna in the morning. In addition to these medicines, to have three drops of the tincture of the muriate of iron every two hours in thin syrup. The leg was dressed with flour and cotton wadding.

5th.—The erysipelas more generally diffused over the leg. To stop the calomel and antimony, but continue the chalybeate tincture, and keep the bowels open with the senna.

8th.—The erysipelas quite gone, and the original wound under the knee healed. No fever; tongue clean; and the little patient more cheerful than he had been for a length of time.

In conclusion, I shall shortly refer to two cases of *idiopathic erysipelas*, in which I was consulted some years ago. The one case occurred in a gentleman nearly eighty years of age, who had long been subject to periodical attacks of erysipelas in his legs. I recommended him to take the tincture of the muriate of iron; which removed the attack he was then suffering from, and he remained longer free from the disease than he had done for a number of years. He lived until he was eighty-six years of age.

The second case was that of a gentleman of high talents and acquirements, rector of an academy in the south of Scotland. He had an alarming attack of erysipelas, and was attended by two intelligent medical men, who had adopted all the usual remedies with very little advantage. They, therefore, considered his case hopeless. The erysipelas was extensively diffused over his head and shoulders; there was much incoherence and great debility. Immediately on his system being brought under the influence of the tincture of the muriate of iron, the disease subsided, and he was gradually restored to health.—*Monthly Journal of Med. Science, June*, 1851, *p.* 497.

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121.—*Empyreumatic Coal Oil used in Eczema.* By M. Lafont-Gouzi.—In the 'Transactions of the Medical Society of Toulouse,' M. Lafont-Gouzi highly extols the virtues of the oil obtained by the distillation of pit-coal in the manufacture of gas, as a remedy in certain eczematous affections, and in itch. He has used the oil in the treatment of eczema impetiginodes, of itch, of prurigo, of psoriasis, of purulent ophthalmia, of keratitis, and of otorrhœa dependent on cutaneous eruption (*otorrhées de nature dartreuse*). M. Lafont mixes eight parts of empyreumatic oil with thirty parts of axunge, and spreads the ointment over the parts affected with eczema; he asserts that it is the most active of siccatives. In cases of prurigo

and of psoriasis, he replaces the axunge with an oil of henbane containing opium (*huile de jusquiaume opiaciée*). If the disease proves obstinate, he uses the undiluted empyreumatic oil. The following case is given in illustration of the efficacy of the treatment.

A woman of forty-five years of age fell under his care, on account of an extensive suppurating eczema of the whole forearm. She had used, for a year, various internal and external remedies, without obtaining the slightest benefit. The mineral waters of Luchon had been tried in vain. The surfaces were very red and encrusted; the intolerable sensation of heat was only appeased by cataplasms of the fecula of rice, &c. Three applications of the empyreumatic oil to the whole diseased surface, made at intervals of five days, restored the skin to its normal condition.

Finally, M. Lafont states that, for the last three years, he has used the empyreumatised ointment with complete success in treating itch, a disease in which so many other remedies have been justly recommended as efficacious.—*Journal de Méd.*—*Monthly Journal of Medical Science, October*, 1851, *p.* 381.

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122.—*On Sycosis.*—By Erasmus Wilson, Esq., F.R.S.—[The author considers this as being essentially]

A disease of the sebiparous glands, whose secretion is poured into the hair-canals; but depending upon a disorder of assimilation, of which the local affection is but a manifestation. In regard to the treatment of this most troublesome complaint, Mr. Wilson mentions that he has found the strong citrine ointment, the iodide of sulphur ointment, and the tar ointment, to be the most useful local applications; but that it is difficult to predict in any individual case, which of these will be most serviceable, one frequently succeeding where another has failed, or even proved highly injurious. At the same time he gives Fowler's or Donovan's solution internally; but he mentions a case in which a gentleman was nearly poisoned by two drops of the former.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 245.

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123.—*Borax in Efflorescence of the Face.*—M. Vanoye, in these cases of red spots, or efflorescence of the face, so often seen in the young otherwise in good health, states he has found washing them several times a day with Hufeland's formula a most excellent remedy. It consists of borax two parts, orange-flower and rose-waters of each fifteen parts.—*Bull. de Thérap.*—*Med. Times, Aug.* 9, 1851, *p.* 160.

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124.—*Treatment of Scabies.*—M. Bazin, physician to the Hôpital St. Louis, of Paris, published in July, 1850, several cases of itch cured in a few days by frictions with the sulphur ointment all over the body. The same physician confirms, in 'L'Union Medicale' of Nov. 9, 1850, the efficacy of the treatment, by stating,—"The patients who formerly left the hospital after twelve or fifteen days only, and very often came back with a relapse of the disease, are now cured in two or three days." But this is not all, for M. Bazin, finding out that some patients have an insurmountable dislike to sulphur, was induced to try several ointments prepared with essential oils—as those of lavender, thyme, rosemary, &c., and likewise turpentine and mercurial ointment. None of these were effectual. He then had the idea of trying unmedicated axunge and oil, and found it answer remarkably well, six frictions during three days being sufficient.

It will be recollected that Mr. Taylor, surgeon to the Clerkenwell Infirmary, published a book some months since (see 'The Lancet,' Oct. 12, 1820, p. 418), wherein he advocates frictions of a like character for the cure of typhus fever, scarlatina, &c. It would be highly useful if frictions, with simple unctuous substances, were more extensively tried in the diseases spoken of by Mr. Taylor and M. Bazin. The ease with which the remedy is obtained, and the little risk which is incurred by its use, would render it inestimable if found efficacious, especially as

regards the treatment of the poor. M. Bazin has likewise tried a chamomile ointment which cures the itch in three frictions. It is composed as follows:—Powder of fresh chamomile, white oil, axunge, of each sixteen ounces. M. Bazin proposes, therefore, in ordinary cases, that the sulphur ointment be used (sublimed sulphur, very fine powder, of each two drachms; one yolk of egg; olive oil, one ounce, and two drachms and a half), in exceptional cases, either three frictions with the chamomile ointment, or six with the simple oil and axunge.—*Lancet, September* 13, 1851, *p.* 253.

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125.—*Carbonate of Ammonia in Chronic Psoriasis.*—M. CAZENAVE has for many years past employed carbonate of ammonia in squamous diseases of the skin. He prescribes 10 parts of ammonia to 240 of simple syrup, the patient taking from six to twenty-four grains of the salt daily.—*Med. Times, August* 9, 1851, *p.* 161.

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126.—*Efficacy of Galium Aparine in Lepra.*—By Dr. J. M. WINN, Physician to the Cornwall Infirmary.—[In a letter to the Editor of the 'Medical Gazette,' Dr. Winn says,]

A gentleman, an acquaintance of mine, who had suffered many years from lepra vulgaris, for which he had taken all the usual remedies without obtaining the slightest relief, informed me not long since that he had at length found a remedy for his disease. He told me that it was a wild plant, of which he did not know the name, but that he would show me the spot where it grew. On examining the plant, I discovered it to be the galium aparine, which grows so abundantly on the hedges in this country, and is commonly known by the name of cleavers or goose-grass. At the time I saw him he was taking a strong decoction of the plant, and under its use the rash was disappearing rapidly.

On making inquiries, I find that three other parties have been cured of similar diseases by the same remedy. One of the parties had been discharged from St. George's and also from the Middlesex Hospitals about twenty years since, as an incurable patient. The remedy was introduced here about twenty years since by some German itinerant quack.

I have as yet not had much experience in the use of this remedy. It appears to act as a mild diuretic, and may be given in large quantities, as it does not produce any injurious effect on the system. I use a decoction made by boiling a large handful of the plant in a quart of water for about twenty minutes. Of this decoction I give three parts daily.—*Med. Gazette, October* 3, 1851, *p.* 606.

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127.—*Treatment of Lupus by the Topical Application of the Bi-ioduret of Mercury.*—M. CAZENAVE ('Annales des Maladies de la Peau,') after trying a variety of local applications in lupus, has come to the conclusion that none is more efficacious than the bi-ioduret of mercury. After a certain number of applications of this drug, with the transient local inflammations which it excites, he has seen the hypertrophied tissues, as it were, dissolved, the tubercles disappear, and soft cicatrices form. He has, in fact, seen the most repulsive cases heal, with no more disfigurement than arises from a patchy discolouration of the integuments.

The application is not in general painful at first, but it is soon followed by severe suffering, which lasts from six to twelve hours. The pain is accompanied by erysipelatous redness of the parts adjacent; but the redness and swelling subside in three or four days. The iodide of mercury then forms a crust with the exudation which it occasions, and on falling off displays a smooth cicatrix. The same effects follow the application to lupoid ulcerations.

The bi-ioduret of mercury may be dissolved in ether, incorporated in an ointment, or suspended in oil. M. Cazenave prefers the latter. As the application is painful, and requires to be repeated five or six days, he recommends that only a small space should be touched at once.—*Provincial Med. and Surg. Journal, June* 11, 1851, *p.* 330.

## VENEREAL DISEASES.

### 128.—ON THE TREATMENT OF VENEREAL DISEASES.

(*From a Review of the Works of Messrs.* ACTON, JOHNSON, *and* HUNT, *on Diseases of the Urinary Organs, in the* 'British and Foreign Medico-Chirurgical Review.')

[The Reviewer, on the subject of treatment, remarks:]

Without bringing forward our own daily experience, we could easily prove from the writings of others, and from authenticated results of practice which has been essentially "expectant," that gonorrhœa, even of a severe kind, often terminates spontaneously—that when a patient avoids wine, spirits, coffee, and beer, takes little exercise, drinks freely of water or any simple diluent, and observes scrupulous cleanliness, the disease commonly attains its maximum in a week, continues in this state one to two weeks, then gradually declines, and terminates about five or six weeks after its commencement. If to this natural treatment a little tartarised antimony be given when inflammatory symptoms run high, and a dose of castor-oil occasionally, the termination is hastened, especially if some simple astringent injection be used. That recommended by Mr. Johnson is a very good one. It is stronger than the solution of diacetate of lead generally used, containing two drachms of the *liquor plumbi* to six ounces of distilled water. We seldom find more than two requisite. One is a solution of alum, four grains to the ounce; the other an infusion of green tea, a drachm to half a pint. By ringing the changes upon them, we believe that all the good which an injection can afford may be obtained.

When the stomach will bear it, copaiba may be given in drachm doses for two or three days, and continued if it appear to be beneficial; but beyond this we do not believe it either necessary or advisable to proceed, in one of fifty such cases as ordinarily present themselves.

[Mr. Acton describes his method of active treatment, as follows:]

"When a patient applies to me in the early stages of gonorrhœa, before scalding in making water has come on, or when the acute symptoms have passed, I at once employ a strong solution of nitrate of silver; but as this efficient mode of treatment may become a very dangerous agent, I always inject the solution myself. The manner I proceed is as follows:—Having a solution of the crystallised nitrate of silver at hand, in the proportion of ten grains to one ounce, I desire my patient to make water, and placing him in an erect position against the wall, I inject a glass syringe full (about two drachms) of the solution into the urethra, and by pressure retain the fluid in contact with the mucous membrane a few seconds. It is as well, in doing this, to suddenly distract the patient's attention by some remark, otherwise the passage of the fluid along the whole length of the canal may be impeded by spasm or contraction of the organ. I then desire the patient to sit down for ten minutes or a quarter of an hour in an arm-chair, and to withstand the desire of making water, which, for the first few minutes, sometimes is very violent.

"The effect of the injection on different individuals is very striking. Some scarcely feel any pain; others suffer for a few moments most acutely, but usually the agony goes off in three or four minutes, and is replaced by mere temporary soreness, so that the patient is able to walk about. I, however, recommend him to lie down on the sofa for an hour or so, and keep quiet.

"The quantity of discharge, like the amount of pain, differs greatly in different individuals. Sometimes no further *discharge at all* is seen, and the patient gets perfectly well. More commonly the injection is immediately followed by a large quantity of serous or shreddy exudation, which soaks through the lint. This exudation is followed by a stringy yellow discharge. In a few hours this gradually becomes again serous, until it completely ceases, and redness of the meatus alone remains, which disappears in a few days.

"Of course considerable pain would be felt did the patient make water immediately after the injection; but as the bladder has been previously emptied, micturition is not required, and the patient has only to combat for the first few minutes the desire to attempt it; and many hours will elapse before urine will be required to be passed, and by that time the effects of other treatment have been brought to bear, so that scalding is seldom or never complained of by the patient.

"I have now no fear of leaving my patient, having applied a suspensory bandage, or what answers equally well, a handkerchief passed round the loins, and another tied in front and behind to support the testes, with strict injunctions to abstain from any kind of fluid whatever, so that the urethra should enjoy a few hours' repose. On the next morning the discharge has either altogether ceased, or a drop is only to be seen, and in the course of the day a mere weeping from the urethra occurs. The patient may now take fluids in moderation, consisting of either tea or soda-water, but coffee should be strictly prohibited, as well as wine, beer, and spirits. In some cases, towards the afternoon, the discharge returns again. If this becomes green or yellowish, I have no scruple in repeating the injection, with similar precautions; but I seldom have recourse to a third, and my patient is quit of a troublesome complaint in a very few days.

"The effect of nitrate of silver in a strong solution is very surprising, as may be judged of from the previous description. It appears to possess a specific action in changing the vitality of the mucous membrane, substituting for the original inflammation a new one, whose principal characteristic is its short duration; it destroys, likewise, the morbid element.

"Out of the large number of cases that have been treated on this plan, I have never yet seen any ill consequences arise, not even hemorrhage or retention of urine. I may mention, however, that I have never employed the remedy except in private practice, where I have had the assurance that my patient would implicitly follow my directions. I should not recommend the treatment among out-patients at public institutions, nor, in fact, have any expectation that any abortive plan will generally succeed with them, but, on the contrary, be attended with such consequences as would soon prevent a surgeon from employing the treatment in private.

"I must, however, confess that this treatment has not, in my hands, been successful in the treatment of the first attack of clap in young men. In private practice a consulting surgeon does not attend, generally speaking, very young men with their first attack. Shyness, or not knowing where to apply for advice, perhaps, is the cause; but of the fact there can be no doubt, that I am comparatively rarely consulted for first attacks. When consulted, the complaint has perhaps commenced several days, and the treatment is therefore no longer efficacious. From these circumstances, I am perhaps hazarding a wrong opinion; but, speaking from my personal experience, I would not advise caustic injections to be applied in cases of first attacks. No dangerous symptoms arise with common care; but I have not met with those certain results which have attended my treatment in persons previously affected.

"So great has been my success, that, with the precautions fully detailed above, I should strongly recommend the treatment in private practice, where, if it was not successful, a surgeon would be soon obliged to lay it aside, or be compelled to relinquish it, if it was found to be followed by ill consequences: otherwise, instead of giving it up, the surgeon would be given up by his patients.

"My own experience does not enable me to say if direct treatment, by means of injections alone, would succeed. I am always in the habit of combining it with general remedies, the modus operandi of which I am about to describe."

Now, (says the Editor of the 'Medico-Chirurgical Review,') we have given a pretty fair trial to this treatment, and have done what Mr. Acton has not, namely, endeavoured to ascertain its value alone, not vitiating the experiments by employing other means at the same time. The result has been, that it failed about as often as it succeeded; and when it failed, it made matters worse than before. We found it also quite impossible to determine beforehand if it would succeed or fail; and as an abortive treatment found it not more successful than a plan of steeping the penis in hot water, three times a day, for a few minutes at a time, until some faintness is produced. In slight cases we have often known this simple measure cure the disease in one day. Mr. Johnson decidedly objects to the nitrate of silver in the early stage of gonorrhœa. He says: "I have seen several cases of gonorrhœa, of a most obstinate and serious description, after its adoption. I have also seen inflammation of the bladder, enlarged lacunæ, stricture in the anterior part of the urethra, and acute synovial rheumatism follow it." He relates one case which terminated fatally, after purulent discharges from the bladder for some months; and another in which synovial inflammation of the knee-joint was severe

and obstinate, the ill effects in both cases apparently depending on the nitrate of silver. M. Ricord acknowledges that his plan "sometimes produces severe accidents, inflammation or gastro-intestinal irritation, and eruptions on the skin:"—we presume when he gives copaiba at the same time. Mr. Johnson says that he has seen nearly fatal gastro-enteritis caused by large doses of copaiba, also inflammation of the kidneys; and he has been consulted in numerous cases of aggravated dyspepsia, in which the patients entirely attributed their complaints to overdosing with copaiba.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 186.

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139.—*Prophylaxis of Syphilis.*—Dr. Langlebert announced to the Academy that he had discovered a substance capable of destroying the effects of the syphilitic virus. This preservative consists of a strong alcoholic solution of soap, having an excess of alkali. Dr. Langlebert had performed several experiments by inoculating with the poison of chancres, and then employing his antidote within about five minutes afterwards. The effects of the virus had in every case disappeared.—*Med. Gazette, August* 8, 1851, *p.* 259.

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130.—*Syphilization.*—Here is a new term, and well may a new term be used, for the fact to be conveyed is quite new; but whether what is called syphilization is a good and allowable thing, is very questionable. Our readers are aware that Dr. Auzias Turenne, of Paris, succeeded some time ago in grafting syphilis upon animals, a result which had in vain been before sought. Monkeys were the poor creatures experimented upon; and it would appear that they actually and truly were made to contract syphilis by means of inoculation.

This success seems to have given Dr. Turenne a taste for inoculating; he went on experimenting, and at last found out that the syphilitic virus, like that of variola, may, by being inoculated upon a perfectly healthy person, preserve that person from any further attack of syphilis, although the patient may get in the way of taking the disease; this taking place in the same way as inoculation of the pus of small-pox sometimes preserves from any further onset of the disease. Cases are of course brought forward to strengthen this position.

But Dr. Sperino, surgeon to the venereal hospital of Turin, has gone still further. He has first fully confirmed Dr. Turenne's conclusions, in acting upon *fifty-two* of his patients; these were mostly affected with primary or secondary symptoms. The inoculations used to be made on the abdomen, and the spot covered with adhesive plaster, so that none of the virulent matter should be lost. Chancres were almost always produced, and they were allowed to heal without cauterization, the pus having been taken either from the patient herself, or from another, where the chancre appeared to be in the progressive stage.

Further inoculations, after the first had succeeded, yielded no result; and though Dr. Sperino went on placing virulent matter in the canal of the urethra, close to the anus, or on the vulva of women previously saturated with virus, he found that it would no longer take. The patients by being artificially syphilized, had in fact become proof against syphilis.

But not content with establishing this law (?) Dr. Sperino has formulated another; viz. that virulent inoculations are not only *prophylactic* but *curative!* All or nearly all the women who were inoculated, got rid either of the recent ulcers with which they were affected, or of chronic ones which had resisted mercury, iodine, &c. Thus it would now appear that infection need not any longer give people uneasiness: let them have the courage to get inoculated, and they are mailed against the syphilitic poison. Or if they should have any recent or chronic chancres upon them, let them again have recourse to inoculation, and they will not only be henceforth invulnerable, but they will also see their present symptoms disappear promptly. This discovery will certainly have a depressing effect on the sarsaparilla trade.—*Lancet, October* 21, 1851, *p.* 346.

## 131.—ON SYPHILIS.

By W. Acton, Esq.

"Syphilis is a virulent and specific affection, the essential character of which is its dependence on a *special* cause, or a distinct morbid poison or *virus*, identical, and hitherto thought peculiar to man.

"Never arising *suâ sponte*, but always, in the present day, the result of contagion from another person, capable of producing, when coming in contact with the economy, local effects, in which we find the fatal cause which has produced them. These local consequences may react on the system, and develope constitutional symptoms which, under certain circumstances, are readily transmissible from the parent to the child, but which cannot again reproduce the specific cause which gave rise to them. Now, although this specific cause may reproduce its effects several times on the same individual (when placed under the necessary favourable circumstances), the general constitutional symptoms will occur but once in a man's life. Lastly, syphilis may be called a disease which most frequently requires a special treatment."

*Chancre.*—The true characters are best observed in the artificial ulcer produced by inoculation:

"During twenty-four hours succeeding the operation, the inoculated point becomes red; in the course of the second or third days, the surrounding parts are slightly swollen, and assume a papular appearance, or already traces of a vesicle are seen on the summit; on the third or fourth day a fluid, which is more or less transparent, is observed beneath the epidermis, and a distinct vesicle becomes apparent, where the papula previously existed, and a dark dot is seen in the centre, owing to the coagulation of the blood which had escaped through the puncture of the lancet; from the fourth to the fifth day, the vesicle assumes a pustular character, and a distinct depression is seen in the centre, so that it represents very distinctly, at this period, the small-pox pustule. The red areola, which has been hitherto gradually augmenting in intensity, now as gradually fades away, and the cellular tissue, which was slightly œdematous, becomes infiltrated with plastic lymph. On the 6th or 7th day, the pustule is observed to be wrinkled, in consequence of the contents becoming thicker, and ultimately a crust takes the place of the pustule. If not interfered with, this crust assumes a conical appearance, increasing always at its base; it may ultimately fall off, or, if removed, leaves an ulcer seated on a slightly œdematous base, in depth equal to the thickness of the skin: the bottom of the ulcer is covered with a whitish pulpy substance or false membrane, which adheres so firmly, that it can with difficulty be wiped off. The ulcer is generally circular, and appears as if made with a *punch*.

"The margin, if viewed by means of a microscope, will be found dentated, and covered with a secretion similar to that seen at the bottom of the ulcer. The border is slightly œdematous and raised, and the areola around it is of a browner tint than at the previous stages; this œdematous condition of the border occasions a slight eversion of the edges, and hence the ulcer may assume a somewhat infundibuliform appearance."

This secretion removed from the surface of the chancre, and kept in close bottles during seven days, will produce all its effects at the end of that period, proving that the vitality of the part is not necessary for the preservation of the peculiar effects of the virus. To show the very minute quantity of virus necessary for producing specific effects, one drop has been diluted with a pint of water, and the inoculated fluid has produced a pustule. If alkalies or acids be mixed with the virus, and inoculation afterwards attempted, no effects will follow. These same substances will likewise destroy the property with which inoculation has invested the sore, of producing an analogous secretion, provided they be employed at an early stage. Simple substances, or ointments, will have no influence either in destroying or aiding the effects of the secretion.

[Mr. Acton declares that nothing but inoculation can positively declare a sore to be syphilitic. Mr. Acton is a strenuous advocate for the use of caustic.]

"Experiments on inoculation have incontestably proved, that if caustic be employed soon after the receipt of the virus, all further effects may be stayed; they have, moreover, shewn, that up to the third day the disease is of a local

nature, entirely confined to the parts with which the virus has come in contact; and the patient may be guaranteed against the occurrence of secondary symptoms. I would remark here, however, how different are the laws of animal poisons. Glanders, when inoculated, and the pustule destroyed in twelve hours, produces its effects as usual; the rattle-snake poison acts still more rapidly, each animal poison having laws of its own. We may be called in too late; but the surgeon must not be inactive, he must combat the disease with all his means.

"If, however, it may be desirable to cauterize abrasions or excoriations, the injudicious and continued use of escharotics may act as an irritant, preventing the healing of a sore.

"This is often witnessed in patients who think that they can treat their own cases, and following, as they believe, the surgeon's plan, employ nitrate of silver most bountifully. Great pain is produced; a deep eschar comes away in a few days, the irritability of the organ is greatly increased; and being unable to uncover the glans, the patient now seeks the assistance of his surgeon, who, after carefully examining the parts, finds the original sore re-inoculated, and perhaps several other small ones in the neighbourhood. These cases clearly show that the employment of caustic, in injudicious hands, may often do more harm than good; that while the nitrate of silver destroys the virus of one sore, the irritation it produces prevents us seeing the mischief accruing to others; and probably the non-observance of these rules has led to caustic being very much abused. Before we employ nitrate of silver, the part should be carefully cleansed, by being soaked in warm water, as the virus may exist on the surface of the neighbouring skin, and, if not washed off, will re-inoculate the sore when the little eschar falls, and undue blame will be thrown on the caustic. Although, then, no other ulcer exists at the time of using the escharotic, still another sore, or little pustule, frequently in a few hours after, will be met with, which, if precautions be not taken, will go on increasing, and the disease will spread rapidly. These circumstances explain several anomalies which have thrown discredit on caustic. The parts should now be carefully dried; and if it be an excoriation the surgeon is called on to treat, the skin should be put on the stretch, and the solid stick of nitrate of silver lightly passed across it, so as effectually to whiten the surface in its entire extent. All cracks and crevices must be treated in the same way, and dry lint applied for the next eight or twelve hours after cauterization.

"Should the surgeon be called upon to treat chancres at the orifice of the prepuce, presenting the appearance of cracks, he must draw back the prepuce gently, and he will be enabled to cauterize the entire extent of the chancre; but, in repeating the operation, let him take care not to rupture the cicatrix, or this linear chancre will extend. The same observation applies to treatment of chancres on the frænum. To obviate the difficulty of healing such ulcers, I usually divide the frænum, and cauterise the whole of the cut surface. Without these precautions, it may be weeks before you will heal such sores. Reliance must not be placed alone on caustic and previous ablution, but extension of the disease should be stayed by lotions of an astringent kind. The one I prefer is a solution of pure tannin, in the proportion of two grains to the ounce of water, which not only checks the discharge, but seems to tan or harden the skin. The private patient, however, should be told that this solution slightly stains his linen with a brown mark, or the lotion may tell tales to the family. To obviate this, a weak solution of sulphate of zinc may be employed, or, if desirable, dry lint; but dry lint has the objection, in some instances, of irritating the part, and prevents the little eschar falling, thus preventing us from re-applying the caustic.

"We now come to consider how soon the caustic should be re-applied. The rule I follow is, to employ it as soon as the eschar is removed, and this will vary in many cases; generally speaking, it is sufficient to cauterise once in twenty-four hours, particularly if the sores be numerous or large. More frequent applications might be useful, did they not produce irritation; and, should swelling of the prepuce arise, the mischief will be greater than by allowing the disease to run its course, as, in the latter case, we should be unable to employ ablution. Before removing the lint, let the part be well soaked, or the little eschar may be detached.

"If, however, nitrate of silver is useful in abrasions and excoriations, reliance should not be placed upon this escharotic in severe cases, or where pustules or

ulcers are formed. Experience teaches us that this salt is not sufficiently potent, its action being confined too much to the surface, and repeated applications are necessary, which may be oftentimes inconvenient. Whenever, therefore, the surgeon is called upon to treat a pustule which he suspects to be a chancre, let him open it, remove the pus with a point of lint, and fill the little depression with Vienna paste, or cauterise it with the solid lime and potash caustic. In cases where a scab covers the ulcer, the former must be first removed: this is readily done by a poultice or water-dressing, and then, after carefully washing the surface, a layer of one or other of the above-named potent caustics may be placed on the sore, and allowed to extend a little beyond the margin of the ulcer.

"The application of the escharotic is, of course, followed by considerable pain, which gradually goes off; the sore, however, should be exposed until the eschar is dry, or the paste would act on any part it comes in contact with. The eschar falls in due course, and leaves beneath it, generally speaking, a cicatrised spot, or a healthy sore, which has lost its specific action, and heals in a few days under a mild astringent wash.

"Cauterisation, however, will not be found of the same efficacy in very large ulcerations, nor have we seen such favourable results when sores are situated on mucous surfaces, or where they are kept damp; in these instances, the abortive treatment does not succeed. Furthermore, the escharotic is not generally applicable in chancres attended with inflammation. Experience proves here, as elsewhere, that although nitrate of silver may be useful in allaying irritability, and in curing subacute inflammations, its employment in acute inflammatory attacks is very doubtful, or, at most, useful in but a very few instances; and though surgeons may derive great benefit from its employment in chronic ophthalmia, in scrofulous constitutions, and in subacute inflammation of the urethra, few, if any, recommend it in acute affections of these organs, unless in the single exception of erysipelatous affections of the skin, in which it has been, like many other applications, much vaunted, and subsequently laid aside. When chancres are attended with acute inflammation, caustic will be worse than useless. Experiments prove that phagedæna destroys the virus, and they likewise show us that caustic often increases instead of allaying inflammation; therefore when the latter is present, recourse must be had to opium, rather than to nitrate of silver, as I shall show when treating of that variety of chancre.

"But it is not alone in acute inflammatory chancre that we must lay aside the use of caustic; we should never apply the salt when previous applications have irritated the sores, or we might continue its use *ad infinitum*, without healing the ulcer."

Another counter-indication to caustic, is induration of a sore; if it be applied in these cases, great pain will be produced, the sore will become irritable, and gangrene will often follow. In simple cases, Mr. Acton recommends no constitutional treatment and argues strenuously, and we think with good reason, against the use of mercury.

*Inflammatory Chancre* is usually met with in young plethoric men, who live high. If it be not treated by active depletion, it may readily terminate in gangrene. Where this occurs, the specific nature of the virus is destroyed, and secondary symptoms never follow. A saturated aqueous solution of opium is the best local application, and opium internally, and in full doses, is generally necessary.

*Phagedænic Chancre* often occurs in anæmic, irritable, dissipated subjects. It presents the following appearances:

"The phagedænic sore may vary in size from that of a pea to a crown piece; usually it is superficial, rarely extending deeper than the subcutaneous cellular tissue. The shape is more or less round, but still irregular; the edges, of a brownish hue, are usually undermined, and the disease has a tendency to burrow, particularly if position assists it. The base of the sore is somewhat swollen, not, however, indurated; the surface is uneven, covered with little eminences and depressions; presenting here and there attempts at cicatrisation; a more or less adherent yellow matter covers the ulcer, which it may be difficult to remove, or which comes away in shreds. Granulations are altogether absent; or, if any exist, they are observed to be pale, few in number, transparent, and swollen, looking like vesicles; more frequently, however, the surface is of a greyish yellow colour, interspersed here and

there, with little bloody points or reddish lines. The pus is thin and offensive, holding in suspension the detritus of the tissues and flocculi of pultaceous matter; it is inoculable during the progressive period. This ulcer rarely extends, however, beyond the subcutaneous cellular tissue. It may last a long time, and cicatrisation may be much retarded.

"It is not uncommon to see, on the surface of phagedænic ulcers, a species of ecchymosis and sphacelated spots. There is pain, of a peculiar stinging, smarting kind, which keeps the patient very restless. The general symptoms seldom run high; the fever is rather of an adynamic kind; there is often prostration of the vital powers; in advanced stages of the disease, the appetite is lost; there is pain in the head, palpitation, neuralgic pains, and a peculiar unhealthy hue of the skin; various eruptions may appear, either around the sore or on the body; these may consist of ecthyma, eczema impetiginodes, or rupia, all of which have been and may be mistaken for secondary symptoms. The debility and general prostration of the animal powers gradually increase, and the patient, unless relieved, gradually sinks, worn down by diarrhœa and colliquative sweats. M. Ricord states he has found ulcerations in the intestines, in cases in which he has had an opportunity of performing post-mortems."

In these cases, mercury is most injurious, but the greatest benefit will be derived from *iron*. Mr. Acton uses the tartrate, but probably any other form would answer as well.

In *Sloughing Phagedæna*, Mr. Acton has most confidence in opium given freely in large doses. Destruction of the surface of the ulcer by nitric acid is also useful in some cases.

[For the *Indurated Chancre* mercury is indispensable, and it should be continued as long as any induration remains. The hardness may not be at first specific, but merely the result of irritation, and if so, may disappear under simple application. If the hardness persists, however, the mineral must be given.

*Urethral Chancre* is the cause of *virulent* gonorrhœa, hence its existence explains those cases which have led to the opinion of gonorrhœa being capable of producing secondary symptoms. In all doubtful cases, inoculation must be practised to clear up the diagnosis.]

*Syphilitic Cutaneous Eruptions* may all be classed under the following heads: exanthematous affections, vesicular, papular, tubercular, pustular, and ulcerations.

Roseola is the common form of the first, and is often confounded with a similar eruption caused by the administration of copaiba, which disappears whenever the drug is omitted; and also with a form of *pityriasis*. In arriving at a diagnosis in this latter case, Mr. Acton is determined by the co-existence or absence of condylomata, psoriasis palmaris, and sore throat.

Syphilitic vesiculæ are exceedingly rare. Where a patient presenting an eruption of this kind appears of good constitution, the vesicles being distinct and the intervening skin healthy, the disease is not syphilitic.

Lichen is the usual form of papular eruption: our author believes that both lepra and psoriasis are merely modifications of it.

"Those who have specially written on skin diseases, have, as it appears to us, rendered more difficult an acknowledged difficult subject; they have attempted to create distinctions between *lepra* and *psoriasis*, which, in our opinion, are both terminations of a papular eruption. The *lichen* above described may become dry at its summit, scales may form, fall off, and be reproduced, and this process may gain the base, and extend itself in an irregular manner, constituting what authors call *psoriasis*. On the other hand, the base of the papule may become scaly, the centre or apex remaining in a natural condition; the result is that a circle is formed of these little scales, surrounding and surrounded by healthy skin; and as this circle is somewhat prominent, from a slight swelling of the dermis now secreting the scales, it has been considered sufficiently characterised to be termed *lepra*. On the same individual *lichen*, *psoriasis*, and *lepra*, may be seen; and we may here observe, that the little white border, described by M. Biett as characteristic of the syphilitic affection, is often wanting."

In the diagnosis he again relies on the same indications as in the exanthemata.

In the treatment, he strongly recommends mercurial fumigations, and we can

bear testimony to the value of the plan. The following is the method of administration:

"The patient, having undressed, is seated naked on a chair in a large box, his head being the only part exposed to the air. This box is heated by a furnace, on which the bisulphuret of mercury is placed, in the proportion of three drachms for each vapour-bath. The intense heat applied soon volatilizes the mercury, which quickly fills the well-closed chamber or box with a leaden-coloured vapour that condenses on the body of the patient, who is exposed to its influence for twenty minutes, during the last ten of which he perspires profusely. The box is then opened, and the surface of the body is gently wiped, so as only to remove the drops of perspiration: a gown is now thrown over the body, and towels twisted round his legs, and the patient laid on a bed, thus swaddled up, between two blankets, which are tucked carefully round him, and additional covering added. The patient is now left for half an hour, during which he perspires freely, and a glass of toast and water may be given. At the end of this time, the wet clothes should be removed, and the patient thoroughly rubbed down; after dressing he should not at once expose himself to the open air, but remain a short time in a cool room. The vapour, thus administered, may be repeated two or three times a week, for a month or five weeks, and a cure of some of the most rebellious forms of secondary symptoms may be atttained. It may be readily assumed that this treatment is one that cannot be easily carried into effect in the country, as the necessary conveniences are not at hand. In these instances, the vapour-bath may be had recourse to, and the cinnabar may be placed on a metal plate over a little charcoal furnace; but, from some experiments which I have instituted, I find that the mercurial vapour is so heavy, that it will not usually rise more than a foot, and the good effects of fumigation will be slight, as compared with those arising from the real fumigating apparatus. The body should be covered with a dark powder when the apparatus is well applied, and gold leaf will detect the presence of mercury on every part of the body. The above remarks, perhaps, explain why fumigations have fallen into disrepute, as the proper means of application are not always at hand."

Mr. Acton does not believe that condylomata are inoculable. As local treatment, he recommends a solution of chloride of soda as a lotion to bathe the parts twice a day; the parts should be well dried, and calomel be sprinkled upon them, and dry lint kept between the excoriated surfaces.

Under the head of pustulæ, he includes rupia, bullæ, and impetigo of the scalp. He finds the emplastrum ammoniaci cum mercurio an admirable local application.

In the local treatment of alopecia, Mr. Acton recommends stimulating washes, as, equal parts of rectified spirits, eau de Cologne, and castor oil, or, if a stronger one be required, equal parts of vermy water and tinctura lyttæ, some pomade being used also.

The throat is very frequently the seat of secondary symptoms. Patches of erythema appear, which become prominent, and then pale in the centre, extending in size. They are often of a circular shape, or like the figure 8; they frequently ulcerate; their most common situation is on the tonsils, the sides of the tongue, or near the frænum; they are met with less frequently at the corner of the mouth, and on the dorsum of the tongue. Generally the patient has other secondary symptoms at the same time.

*Syphilis in Infants.*—What is said on this subject deserves attentive study; we can merely indicate the points which Mr. Acton argues and illustrates. A woman may contract syphilis during the time she is pregnant, and infect the infant, the father being healthy; but the latest period at which this may occur is not ascertained. A man labouring under secondary syphilis may beget an infected infant, the mother remaining free. A mother labouring under syphilis may suckle her child without giving it the disease. Mr. Acton does not believe that a nurse labouring under secondary symptoms can infect a child. He thinks that an infected fœtus may contaminate the mother, and relates a case, which, however, is not conclusive. Mr. Acton does not believe that an infected infant can contaminate the wet nurse.—*London Journal of Medicine, August*, 1851, *p.* 709.

132.—*On the Iodide of Potassium in Syphilis.*—[The following remarks upon this subject are made by the Reviewer in the 'British and Foreign Medico-Chirurgical Review.']

Dr. Williams was the real discoverer of this influence, perhaps the greatest therapeutical discovery of the age, after that of the anæsthetic effects of ether and chloroform. His paper was read at the College of Physicians in 1834, five years before Ricord began his experiments; and so far from giving it indiscriminately in all cases, he took the greatest pains to investigate its real powers, and pointed out where it was efficacious and where useless; not with hesitation, but with all the open candour of his nature. In his 'Elements of Medicine,' while showing the marvellous certainty of its action in rupia and the hard periosteal node, he showed that its power was much less in roseola, purpura, and ecthyma, but still it was better than mercury; while in lichen, lepra, psoriasis, and iritis, he proved with equal clearness, that mercury, either locally or generally, had more beneficial influence than the iodide. He pointed out the curious fact, that while the action of the iodide on *hard* periosteal node was as certain and evident as that of quinine in ague, when once suppuration had commenced, sarsaparilla was the remedy, the iodide being useless. In soft node and prurigo, he showed the true power of sarsaparilla; and in syphilitic angina and rupia, the invariably good effects of combining local mercurial applications with the internal administration of the iodide.

We witnessed many of his experiments, and for the last twelve years have been guided by his results, without ever having had cause to regret it; and after tolerably extensive opportunities of treating secondary symptoms, the only modification we have learnt to make in his practice, is the occasional use of the protoiodide of mercury in lichen and in some of the affections of ligaments and synovial membranes. We almost always give the dose recommended by Dr. Williams, eight grains three times a day in water or camphor mixture; and when using the protoiodide of mercury, begin with one grain daily in divided doses, increasing gradually to three or four grains in the day, made into pills with liquorice, or with catechu, if it acts on the bowels. Opium appears to destroy its power altogether. We never saw any good done by giving a mercurial course before the iodide, as many recommend, but often much harm. On this point and on the relative powers of iodide of potassium and mercury in syphilis, we would refer to a work in which the investigation has been made in the true spirit of science by Dr. Hassing, of Copenhagen. A notice of this book, and an abstract of some of the important results, will be found in Vol. XX., 1845, pp. 482–6.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 201.

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133.—*On Bubo.* By John L. Milton, Esq.—[Mr. Milton endeavours to show that "bubo is curable in most cases without surgical interference, and in all without cutting or disfiguring the patient."]

The remedy upon which Mr. Milton relies is tartar emetic, given in grain doses every second hour, until a marked effect is produced upon the inflammatory swelling. This mode is very efficacious; but many patients, we think, would prefer the bubo to the medicine.

Mr. Milton, moreover, is of opinion, that, when the tartar emetic fails to check suppuration, punctures, not leading directly to the sac, should be substituted for incisions, and thus deformity and the exposure of a large suppurating surface to the air be prevented.

Our readers are probably aware that a large proportion of venereal buboes, even those which have suppurated, disappear under proper general treatment, combined with rest, without surgical interference; that those which burst heal readily like any other abscess, provided the patient's health be good; and those which are opened by vertical incision heal very readily. But surgeons are slow in opening a bubo without a reason, partly because it may disappear without such a measure, and partly because all abscesses which burst themselves, as a rule, do better than those opened by the knife.—*Med. Times, October* 4, 1851, *p.* 353.

134.—*Chronic Gonorrhœa, or Gleet.*—The chief point of interest in this section is the view put forth by Mr. Acton, that the cause of gleet is the existence of a granular condition of the mucous membrane of the urethra, analogous to that which the speculum reveals in the vagina, in cases of old standing discharges. In the treatment, he examines the passage by a wax bougie, No. 6 or 8. If an irritable unequal surface be detected, he uses the strong caustic injection, and gives copaiba or cubebs; following up by injections of zinc and tannic acid. If incipient stricture is detected, the nitrate of silver is not advisable; but bougies should be passed every other day, astringent injections being used in the intervals.—*London Journal of Medicine, July*, 1851, *p.* 647.

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135.—*Chloroform in Gonorrhœa.*—M. Venot recommends injections of chloroform as an *abortive* treatment of gonorrhœa, that is to say, of arresting it in the earliest period of its development; and thinks that it will replace the nitrate of silver, which is so frequently employed for this purpose. Pure chloroform is injected by a glass syringe, the perineum being pressed upon; the first effect is burning heat, then a sensation of cold follows. The injection does less good after the first two or three days of the gonorrhœa have passed; but, employed before that, it almost invariably arrests it. Injected into the vagina, the results were less satisfactory.—*L'Union Méd.—Med. Times, April* 19, 1851, *p.* 433.

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136.—*Balanitis, or Gonorrhœa Preputialis.* By W. Acton, Esq.—[This disease consists in inflammation and patching excoriation of the glans penis and lining of the prepuce, accompanied by a muco-purulent discharge. The predisposing cause is the existence of the prepuce. The exciting cause is generally the application of some irritating secretion; abscesses close to the frænum, or gangrenous prepuce. Chancre and eczema are frequent complications.]

The treatment of the uncomplicated disease is very simple; it consists in washing the parts, carefully drying them, and, by means of dry lint, accurately placed between the glans and prepuce, separating the two surfaces. If a slight inflamtory condition of the parts exist, it will be well to pass a stick of caustic over them, simply to whiten the surface, which should be previously dried by lint. The affected parts should be washed twice daily with a lotion of zinc and tannin, one grain of each to the ounce, then dried, and lint applied as before. When phimosis exists, lint wrapped round a probe should be carefully introduced between the glans and the prepuce, to wipe away all secretion; the prepuce then being gently drawn forwards, a solid stick of nitrate of silver may be introduced and brushed quickly over the surface, warm water being afterwards injected; or a strong solution may be injected, instead of using the solid caustic. If the phimosis be irremediable, the operation of circumcision must be performed. The following is Mr. Acton's method: "Without employing any traction, I trace in ink a line on the prepuce, which follows the circumference of the base of the glans, and is a little in front of it. This being done, the prepuce should be drawn forward and fixed between the blades of a pair of dressing forceps placed in front of the glans, and behind the line of ink traced on the prepuce; let the forceps be then held in this position by an assistant. Let that portion of the prepuce which is in front of the forceps be now drawn forwards by the left hand of the surgeon, while, at the same time, he with the right divides it in the oblique direction of the forceps, which thus protects the glans. In this operation the skin alone is removed, the mucous membrane is not drawn forward with the skin, and remains intact; if we do not wish to see the phimosis recur, this portion of mucous membrane must be removed. To effect this, I employ a pair of scissors, slitting up the thin layer of mucous tissue as far as the base of the glans; the two portions should then be successively held apart by a pair of forceps, and removed by dividing them at the base of the glans, as far as the frænum, which is divided the last. I generally employ torsion of the arteries in these cases, to check the bleeding; lint dipped in cold water is then applied, and it may be advisable to administer an enema containing opium in

the evening, or to prescribe camphor pills to prevent erections. A perfect cure takes place about the twelfth day, and the result is very satisfactory; there is no deformity, nor have we to dread a consecutive paraphimosis.—*London Journal of Medicine, July*, 1851, *p.* 645.

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## 137.—ON CHORDEE.

By John L. Milton, Esq.

[There are two facts to be noticed as to the cause of chordee as bearing upon the treatment; viz., that there is spasm, and that this is attended by pain, caused, primarily or secondarily, by the condition of the mucous membrane. The following appear the best known and most commonly employed methods of treatment:]

Mr. Lagneau says, "for the inflamed chordee, bleeding from the arm, hot bathing to the perineum, lavements, eighteen or twenty leeches to the canal of the urethra, two or three times repeated, and when the pain is severe, gr. i. of the watery extract of opium, and gr. ii. of camphor," which he recommends giving in the evening. He winds up this energetic treament by a solemn warning not to plunge the penis into cold water, as it may be, and has been, followed by a metastasis of the complaint of the bladder.

M. Ricord recommends gr. iiss. of camphor, and gr. ss. of opium in a pill, of which two or three may be taken every night.

Richter recommends that the patient sleep on a hair mattress, and very cool, or else on a canopy, and do not turn on his back. Eisenmann that the parts should be exposed to the influence of narcotic vapours; or that infusion of camomile or cherry-laurel water be injected or dropped into the urethra. He found sedatives of no avail. He recommends the patient to make water more frequently than necessary, because a distended bladder irritates the vesiculæ seminales and the neighbouring parts. He objects, also, to dipping the penis in cold water, and then recommends soothing injections, or poultices; opium being less useful. Peyrihe recommended ammonia and injections of soap ley. Iodine, the empyreumatic oil of tartar, and blue ointment, have also been praised.

Mr. Hunter says, "he has known twenty drops of the tinctura thebaica take it (painful erection) away for a whole night, and that the cicuta has likewise some powers in this way." For the chordee, he recommends opium joined with camphor, praises local bleeding with the free use of hot vapour to the parts; poultices with camphor; while the effused lymph which remains may be removed by mercurial ointment in friction. He has seen the cicuta of service.

Mr. Wallace recommends calomel and hippo,* with opium and camphor.

Such are the general outlines of the practice pursued by surgeons, as we find it recorded in books. These plans bear a pretty strong resemblance to each other, and are nearly all calculated to lead to one point—the allaying of pain by the use of sedatives. The idea of attempting to remove it by the pure antispasmodics, does not seem to have been worked out or even entertained, although everything seems to show that it is more amenable to them than to opium. I will add but one more remedy, as remarkable for its originality as any I know, and which was, I believe, first recommended in writing by Dr. Colles. It is, that when the patient finds the chordee coming on, *he do turn over, and balance himself on his knees and elbows till the chordee goes off.* The reader can easily imagine what effect such a remedy would produce. Let him figure to himself an exasperated patient struggling in the middle of the night to get ease in this way! Verily, this is surgery!

I now approach that part of the matter which has most of all occupied my attention—the substitution of some simple and always applicable remedy for these different methods of cure. I will not stop to point out the inutility or inapplicability of antiphlogistic treatment to this symptom, as any one versed in the disease must have observed cases where the chordee came on though the patient had been treated most heroically. Sedatives I utterly object to, as I have never used them in sufficient quantity to have any material effect on the chordee without finding the

* Pulv. Ipecac. comp.

patient much worse afterwards. They generally disordered the stomach, produced headache and languor, very often with constipation of the bowels. The scalding and discharges were rendered worse and more obstinate, and, to crown all, the chordee was merely abated for an instant, and returned the moment they were left off; nay, even when they were again administered without increasing the dose. Nor have I ever been able to understand why they should be given, as the pain appears to depend on a spasm, and when this is removed the pain ceases; whereas the spasm does not necessarily subside when the pain is relieved.

I have tried the most powerful anti-spasmodics, as ether, galbanum, assafœtida, and chloroform, and can only say of them that I have found nothing equal to camphor in the fluid form. In powder, camphor is disagreeable to take, and did not appear to act so readily, I suppose from not being so equally diffused and finely divided as in solution. In fact, in spasm a liquid remedy, as admitting of a more rapid action, is always the thing to be sought for. The spirit of camphor, taken in the dose of 3j., in a small quantity of water, is equally energetic and rapid. The objection that it immediately becomes insoluble by contact with water, is sufficiently obviated by the fact, that its operation is most certain and rapid, and that essence of camphor, in which the camphor is so dissolved that it does not separate on the admixture of water, possesses, so far as I have been able to judge, no advantage over the other.

As in many other cases, the chain of morbid actions must at once be broken, and this is done much more effectually by two or three full doses, repeated at short intervals, without the least remission, till the chordee is completely stopped, than by small quantities, however long continued and regularly taken. I therefore invariably adopt the following plan:—

A teaspoonful is to be taken at night in water before going to bed, and *every time the patient wakes with the chordee, let him at once rise and repeat the dose.* In the milder cases, one dose for a night or two is generally enough. In the more severe ones, the symptom is generally removed at the end of the second night, becoming, in the meantime, milder and less frequent after each dose. So long as the clap remains bad, I frequently recommend the patient to take a teaspoonful at night before going to bed, which suspends the chordee till the cure is completed. This plan of treatment also answers well in the bearing down pains to which women are sometimes subject in clap; but as here, contrary to what it is in men, these pains are generally worst in the daytime, it is best to use the essence of camphor largely in the medicine they may happen to be taking.

It must, however, be taken in full doses. A violent sudden pain like that of chordee requires an equally powerful remedy, and there is no use in trifling with it. A less quantity than a teaspoonful will not always suffice to abate the pain at once, though it may materially alleviate it; just as a moderate dose of chloroform will lull the acute pain of an operation without rendering the patient insensible to what is going on, while a smaller quantity, in one full dose, produces complete torpor. Now, as a teaspoonful or two may be safely taken, it is best to insure success at once. In one or two cases, it has produced some sickness, and, strangely enough, this has been more the case with small doses than large ones; this was probably caused by something having been previously taken that had in some measure disordered the stomach. At any rate, the instances have been too few to make the affair of any moment. I only allude to it here, that no one might by its appearance be discouraged from giving so valuable a remedy as camphor really is.

The patient should be directed to keep the camphor in a tightly-corked bottle, and in a cool place, and to have it by his bed-side ready to take. It is best taken in water, as, if dropt on sugar, it produces a strong sensation of heat in the mouth, occasionally preventing the patient from getting to sleep again.—*Med. Times, July* 19, 1851, *p.* 66.

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## 138.—ON BLISTERING IN GLEET.

By John L. Milton, Esq.

[In refractory cases of gleet Mr. Milton proposes to revive or introduce the practice of blistering the penis. Although little known or used, he states it to be the most powerful remedy that can be applied. He says:]

Not merely will a single blister frequently cure the most prolonged gleet,—not merely will it rapidly sweep away all dregs of the disease in its ordinary course, but it will often cure those runnings which have resisted all known and used methods. I have seen two blisters, with a mild injection or two, at once cure a clap which had defied the most energetic treatment; and *as I never found a case which resisted blistering and injections together, that was not complicated with stricture or affection of testicle*, I am slowly arriving at the conviction, *that every case of clap or gleet, however obstinate, may, if uncomplicated, be cured by blistering, singly or combined.*

To illustrate and urge forwards this operation by every means in my power,—to invite attention to it, that it may be put to the severe test of practice, to attest it by cases which I have collected and watched,—to point out the necessity of quitting the beaten paths of treatment, and try a new remedy more powerful than those in use, is the object of this paper. But as so many remedies have fallen into disuse from the indiscriminate use or misapplication of them, and as so many which are in favour have been arrested on their path by obstacles issuing from the same sources, I must here enter my protest against being supposed to recommend blistering in gleet, unless properly applied, and in the cases I have referred to.

In order that a blister be properly applied, there are some points which, however trifling they may seem, require as much attention as the leading features of the case. Where these are neglected, blistering is apt to produce such a filthy excoriated mass, that the patient will not submit to it a second time; whereas, if carefully laid on and dressed, it is, from its being out of the reach of friction in the ordinary movements of the body, even less troublesome than if on a limb or the trunk. Before putting it on, the hair at the root of the penis is cut off, and, if the foreskin be naturally retracted, it must be drawn a little forward over the glans. A piece of paper is then to be fitted on the penis, and cut till it exactly covers it from the root to within half an inch of the mouth of the urethra. This is then laid down on the blister, which is cut out by it, wrapped round the penis, and fastened with threads behind the glans and near the root. The patient should remain perfectly quiet during the time it is on, lest any motion should bring the blister against the scrotum, and vesicate it; but he must not apply it on going to bed, or he will most likely fall asleep, and not awake till the penis is one mass of vesications,—a state productive of an unnecessary amount of suffering.

In the milder cases, or where the skin is tender, an hour or an hour and a half will be sufficient. The blister is then removed; if there are any vesicated spots, they are covered with pieces of linen spread with zinc ointment, and then a layer of cotton is bound over these, and covered with a piece of linen, kept on by a thread, or, what is better, two very thin rings of vulcanised Indian rubber.

Where a severer case renders a more energetic employment of the remedy necessary, it must be kept on two or four hours, until free vesication is produced; zinc ointment is then applied. To protect the penis from friction, a T bandage, with a linen bag sewn into the part which receives the penis, or a handkerchief carried round the waist and dipping in front so as to receive the penis and keep it up against the abdomen, is necessary.

The first effect of this application is to increase the discharge considerably, which then terminates either by altering its character, becoming ropy and mucous, and finally disappearing in a few days, or by remaining somewhat more persistent and requiring a few injections, when the penis is so far advanced towards healing that it can be handled without pain, or demanding even a second blister. One of the most cleanly and convenient, and least painful forms of blister, is Brown's blistering tissue: it causes much less irritation, and heals much more quickly than the ordinary blister. The blistering fluids, if strong enough to vesicate, caused such pain that I soon renounced the use of them.

How does this remedy act? By counter-irritation will, perhaps, be the answer. But, if this were the case, why should there be increased action in the urethra for a few days, and why should the discharge from the urethra begin to disappear when the counter-irritant surface is healing up? It would seem as if the organized constituents of the urethra are capable of keeping up a certain amount of overaction for an indefinite time; but that when hurried beyond this by a healthy stimulant, *a rebound* takes place, which leaves them less capable than before of

furnishing a secretion, morbid in amount or in quality, or in both. We see something similar in prurigo pubis, where a blister causes an exacerbation of the symptoms, succeeded, however, in some cases, by a healthier state of the skin; in bubo, treated by a blister, &c.

The cases which now follow have been selected from among many, with a view of showing the applicability of the remedy, not merely to a variety of cases, but under a variety of circumstances, which, in practice, are not less to be considered than the nature and duration of the disease itself.

*Case* 1.—*Slight Acute Gonorrhœa.* A. B. applied to me, February 28, with gonorrhœa, which he had had four days, and which was treated with salines, there being some feverishness present. On the 5th of March, there being no improvement, a blister was applied, and some sulphate of magnesia was added to his medicine. On the 12th he came again; the cure was complete.

*Case* 2.—*Slight Acute Gonorrhœa.* Joseph G——n, contracted gonorrhœa, March 11, 1850; there was no chordee or painful erection, and only slight scalding.

14th. Saline powder every morning.

19th. The scalding continues, the discharge better. Soda and jalap powder to be taken twice a day.

21st. The scalding continues. To go on with the powder and use a zinc injection, 3i. ad Oj.

26th. The scalding gone, the injection has relieved him most of anything.

April 6th. He returned to-day as bad as at first, and was then blistered.

13th. Every trace of the discharge gone. I saw him some months after; he had remained quite free from any discharge.

*Case* 3.—*Protracted Acute Gonorrhœa.* John I., applied April 10th, 1850, with a running which he had had for six months; there was a free discharge attended with pain and scalding, and he seemed very weak.

Mist. ferri c. ℥j.

Dec. aloes c. ℥ss.; mix and take three times a day.

12th. The medicine agrees with him, but there is not the slightest alteration in the discharge. He has long used injections, etc., without any benefit, and as he cannot attend regularly, I have ordered a blister to be applied to the penis.

15th. The discharge is almost gone.

To have two pills of turpentine and strychnia every night and morning.

19th. He has not had any discharge since his last visit.

*Case* 4.—*Protracted Acute Gonorrhœa.*—Mr. D., a healthy man, applied to me Oct. 15th, 1850, with a clap, which he had had five months. He had taken an immense quantity of copaiba, purgatives, &c.; but, in spite of all this, the disease was always coming on again as bad as ever. However favourably it might promise for a few days, it was sure to return. He asserts that he took the medicine exactly as it was ordered, notwithstanding the great aversion he has to copaiba, &c. When I first saw him, he had little chordee or scalding; but there was a very free, thick, purulent discharge. He had used strong nitrate of silver injections, which gave him great pain, but produced no beneficial effect on the progress of the disease. He never subjected himself to any great restrictions in diet, and it would appear that he and his surgeon somehow or another, never carried out very consistently any plan of treatment; for when the patient was getting well, the medicine was left off, as if both were tired of it. Sometimes it was suddenly changed, and then the old copaiba mixture was resorted to, apparently without any particular reason; sometimes the patient proposed a medicine, which was forthwith accorded him; at last he came to me.

Finding his stomach much disordered, I prescribed liq. potass in bitters. This was immediately followed by an increase in the scalding, to check which the acet. of potass was substituted, and calomel and ipecacuanha were ordered at night. At the same time, I injected him with chloride of zinc, and he himself, two or three times every evening, used the acetate and sulphate of zinc in injections; but the painful erections, constipation, pain on making water, went on unabated. On the 21st, he was suddenly attacked with irritability of the bladder, and all medicines were suspended, except the use of ether and camphor, which, with hot bathing, seemed to afford him some relief. On the 31st, all symptoms of irritability

having passed off, the calomel and ipecacuanha, with the acet. of potass, were recommended, and caustic suppositories were substituted for the injections. He also went into the country, but grew worse, though he lived very regularly.

On the 8th of November, he began using the camphor, to check the erection, which had become latterly nearly as bad as ever. The discharge was unchecked.

To be blistered.

16th. The blister was kept on three hours and a half: it was followed by a free discharge from the urethra. In all other respects he is better.

12th. The soreness of the blister is so far abated, that injections can be used. To have the sol. of chloride of zinc, and nitric acid and bark.

13th and 14th. The discharge now rapidly decreased; the erections and scalding have quite gone away.

On the 15th no discharge was to be seen, nor had he noticed any on rising that morning. He was in high spirits. To continue the injections.

19th. On squeezing the urethra, a very little discharge, somewhat like whey, was seen. There was no scalding or erection; but the urethra when pressed felt like a rigid tube, as if in a state of permanent spasm, so that I was disposed to regard this disappearance of the discharge as treacherous. Meanwhile, his general health continued pretty good, and though he worked hard, he was very abstemious.

On the 22nd the injection, which had been continued, produced more pain than usual; and on the 24th a little discharge was again seen. The injection was made milder, and on the 25th it had disappeared.

On the 28th he, for the first time, took a quantity of beer, the immediate effect of which was the re-appearance of the discharge, which, by the 3rd Dec., had again become thick and purulent.

To be blistered again, but to continue in other respects the same. No alteration in diet.

Dec. 6th. After putting on his blister, which he kept on three hours and a half, he found the discharge at once disappear, and has since remained free from it.

On the 16th I saw him again; he had seen no discharge at all since, though he had continued to drink beer, and have connexion with women.

In the spring of the year I saw him again, when he gave me the same account.

*Case 5.—Clap, Relapse, Cure.* W. J. has now, Feb. 1, 1850, had clap three months, for which he tells me he has taken "all manner of physic." It is purulent, and accompanied by pain on erection, scalding, &c.

To take the saline powder, and use a zinc injection, 3j. ad Oj.

March 8th. Though progressing, he is not so well as might be expected; he looks pale and bloodless.

To continue the injection, and take red oxide of iron, 3ss. ter die.

On the 12th, I began injecting him every morning, and by the 19th the discharge was gone. On the 21st it re-appeared, thick and purulent, and accompanied by great irritability of the bladder, which I partly ascribed to his having drunk some beer, and allowed his bowels to become constipated, and partly to the dull, dusty weather. He was ordered a blister to the penis, a strong sulphate of zinc injection, and a saline mixture every four hours, with 3 iss. of sulph. of magnes. in each dose.

22nd. The blister was kept on four hours, and has risen freely; there is no discharge from the urethra, and he feels much better. All pain and uneasiness are gone, and his bowels are freely open.

To go on with the mixture, and dress the blister with cotton wadding, not cutting open the vesications.

From this time there never was any trace of the disease to be seen; on three distinct occasions I have examined the penis, and found no discharge.

*Case 6.—Gleet Alternating with Purulent Discharge.—Cure.* J. B., Esq., applied to me, June 1, 1849, giving me the following detail of his case:—About six years before he contracted gonorrhœa, and, having a deep-rooted dislike to medicines of all kinds, he only lived low, and endeavoured for about fifteen months to let it wear itself out; but, finding it was more likely to wear him out, he applied to various practitioners and some surgeons of eminence, without any success, for the simple reason, that he never did what they told him. He tried copaiba capsules, sea-bathing, shower-baths, and, for a little while, the tincture of steel, but got no

better. Sometimes there was a discharge of pus from the urethra, sometimes only mucus, but he was never free from it; and some surgeons thought he had a stricture; but he never would allow a bougie to be passed, so that the point remained uncertain.

At last a friend brought him to me. As he had still the old dislike to "physicking," I proposed to pass a bougie, and, if there were no stricture, to blister the penis, which he considered a "disgusting nuisance;" but, he said, if there was anything that could be done at once, he did not mind how painful, he would submit to it, "only he would not have instruments poked into his bladder for any one living." I painted the penis with blistering fluid, which immediately produced intense pain for half an hour, and ordered him eight grains of calomel in one dose. This had an instantaneous effect; the discharge went away, and reappeared in a milder form. With great difficulty I managed to procure his attendance for a few days, during which I injected the urethra with solution of sulphate of zinc, and the gleet disappeared completely. I have often seen him since, and he tells me, that sometimes, when suffering from a cold or over-living, he has seen a minute point of mucus come from the urethra, but that, with this exception, he has remained well.

*Case* 7.—*Gleet.—Cure.* G. K., Hoxton, applied, November 6, 1849, with a gonorrhœa which had broken out six days previously. He was ordered a saline powder, to be taken three times a day. I did not see him again until the 1st of February, but I found that he had continued the use of this powder, and had injected himself three times daily with sol. of sulph. of zinc. Finding that his clap had degenerated into a gleet, I ordered him 25 minims of copaiba and 15 of sp. terebinth. three times a day. The injection to be continued.

8th. He appears better. Continued.

21st. The clap still persisting, I ordered a blister to the penis, and 3 ss. of the red oxide of iron three times a day. When seen on the 26th, he was cured of all the discharge. The powder was continued, and he attended regularly till the 1st of March, when no discharge having been seen since the date of the blistering, he was discharged cured.

*Case* 8.—*Gleet.—Cure.* R. T. has now (August 28, 1849) had gleet for about thirty-six days; he has taken various medicines, but without any material benefit.

To apply a blister to the penis for four hours.

30th. The discharge increased very much by the morning after; but in a few hours disappeared, and has not since returned. Nothing can now be seen; the canal seems quite free from moisture, beyond the usual dampness peculiar to it.

He was not again attacked by it.

*Case* 9.—*Gleet of Four Months' Standing.—Cure.* W. H. applied, October 18, 1849, with a gonorrhœa of four weeks' standing. It is not very severe, and up to the present moment, he has not taken any medicine for it.

To take the saline powder three times a day.

30th. He has taken the medicine regularly. There is now only a gleet, but it is accompanied by some scalding.

To have some soda and opium powder, and take two pills with turpentine and strychnia every night.

Feb. 26, 1850. Since the last date, he has attended very irregularly, sometimes taking his medicine, sometimes leaving it off; fancying his gleet was cured, and always finding it return. The tincture of muriate of iron was also ordered him, but had produced no great effect. He has now come for the purpose of being "cured in good earnest."

To blister the penis, and take 3ss. of the red oxide of iron three times a day.

28th. There has been no discharge since. To continue.

March 1. His bowels are confined; to have a purgative draught.

5th. He has seen no discharge since. To continue the powder, from which, he says, he finds benefit; he thinks he finds strength from it, which he greatly needs, being a railway carrier.

Nearly twelve months after, I again saw him; he had had no return of the discharge since.

*Case* 10.—*Gleet of Long-standing.—Cure Protracted.* C. H. applied to-day, Oct. 23, 1849, with gleet, which he has had five or six years, and for which he has tried all the usual remedies, as copaiba, injections, &c.

To blister the penis, and take the steel mixture ℥i. ter die.

25th. Much better; the blister was kept on longer than I ordered, and is now discharging freely. The gleet is lessened.

He obtained a situation the following day, which prevented him from coming any more, drank beer, and neglected taking medicine. In the beginning of February, finding the gleet returning, he was tempted to try some "balsamic pills," but not deriving benefit from this, he again came to me. I found but a very slight gleet, and it appeared from his account, that it had never been anything like so bad since he put on the blister, but still the cure was not complete. He was therefore injected, first with sulph. of zinc, and then with nit. of silver, and took the mist. ferri c. three times a day. In a few days he was cured, and when I last saw him, he had had no return of the disease.

*Case* 11.—*Gleet of Three Months' Standing.—Cure.* R. W. has now, October 31, 1849, had gleet for three months. He has been constantly under treatment, but has observed during that time no improvement.

To blister the penis, and take the turpentine and strychnia pills.

Nov. 7. He is going on well, the discharge being now much less.

To take the copaiba and turpentine, ♏xxx. of the former, and ♏xv. of the latter three times a day.

17th. There has been no discharge since the blister healed.

*Case* 12.—*Gleet of Several Weeks' Standing.—Cure.* Mr. J. J. applied to me January 3, 1850, for advice respecting a gonorrhœa which he had had some time. He had tried to cure it himself, but was not succeeding according to his expectation. As he could not come regularly, I ordered him sulph. of zinc injections, and some saline medicines to remove the feverishness and constipation under which he was suffering. On the 8th he was better, and was directed to continue his medicines, and the same on the 24th, when the injection was made a little stronger. On the 5th of March, nothing remaining but a little gleet, he was put on the tincture of steel, thirty drops three times a day, and left off the injections.

March 20th. I now found that there was still some slight gleet, and the injections were therefore resumed; his bowels being costive, some aperient medicine was ordered.

25th. There is no discharge to be seen, but he says a portion about the size of a pea, and like curd in appearance, came away this morning from the mouth of the urethra. His bowels remain obstinately constipated, and he is fretful about the gleet never going away.

A strong injection, immediately followed by a blister to the penis. 3j. of the pulv. jalap. c. every other morning.

28th. No discharge has been seen since he put on the blister. His bowels were acted on very freely by the powder on the 26th, and have remained costive ever since. He did not take the powder this morning, fearing it might act when he was out.

R. Conf. sennæ, 3ij.; pulv. jalap, gr. x. Misce. fiat mass. omni mane sum.

April 2nd. The same report; no discharge has been seen since. Immediately within the urethra there is a white patch, as if there had been an ulcer.

6th. Complete cure. The white patch is still to be seen.

*Case* 13.—*Gleet of Two Years' Standing.—Cure.* E. S., a delicate, dissipated young man, applied to me Feb. 20th, 1850, with gleet, which he has had full two years. He has taken copaiba at different intervals, and has used injections, but has never once got rid of it. His health is out of order, his appetite bad, and his bowels constipated.

R. Acid. sulph. dil. ♏x.; infus. quas. ℥j. ter die sum. Confec. sennæ, ℥j.; ferri. ses. ox. 3ij. M. sumat coch. j. min. omni mane. Zinc. sulph., gr. iv.; aq. distil. ℥j. Ft. inj. omni mane utend.

Feb. 21. Very much better; the discharge is almost gone; the injection produced a slight tingling. Cont.

22nd. The discharge is gone, his bowels are open, and he feels better.

23rd. This morning a minute point of discharge, like albumen, can be seen on pressing the urethra.

The injection to be increased to gr. viii. ad ℥j.

25th. The last injection produced but very little tingling. He says there was some slight discharge this morning; but I can see none now. He is getting

much stronger, and the confection keeps his bowels open. As he cannot come to be injected, I have ordered him a zinc injection to use three times a day. To continue the mixture and confection.

March 4th. Since his last visit he has occasionally noticed a speck of discharge; on opening the mouth of the urethra and looking in, a white blanched spot is seen; it looks as if the mucous membrane had been burnt by nitrate of silver. Bowels rather too open.

Not to take quite so much of the confection.

12th. There has been no discharge since, and there is none to be seen now.

15th. He has taken to his old habits again and got drunk; the discharge has re-appeared. As he will not or cannot come regularly, I have ordered him a blister to the penis, and to take the mist. ferri c. ℥i. ter die.

22nd. He put on the blister when going to bed, fell asleep, and when he woke next morning, his penis was enormously swollen and quite raw. "It had, however," he said, "done him a mighty dale of good, and drawed away a full half pint of water."

To continue the mixture.

He now left me, considering himself cured, but in February, 1851, was once more a patient with acute gonorrhœa; up to the date of his fresh infection he had had no discharge since using the blister, though he had been very dissipated.

*Case* 14.—*Prostatic* (?) *Gleet.—Cure.* W. O. has now, March 5, 1850, been some time under treatment for gleet; there is great uneasiness and pain about the prostate, particularly on crossing his legs. The bladder seems also disordered, and micturition is accompanied by pain. After he has had a stool, a quantity of glairy matter is thrown out of the urethra; it seems to be about a small table-spoonful in bulk. He has used injections, salines, &c., for twelve months, which have cured the gonorrhœa, but he has noticed no improvement in his gleet.

To take the copaiba and turpentine mixture three times a day, and inject with sulph. of zinc.

20th. No improvement.

R. Hyd. c. cret. gr. iij. Pulv. rhei gr. v. M. om. mane sum.

A blister to the perineum.

21st. The blister has risen freely.

Acid nit. dil. ♏xv.; dec. uva ursi ℥iss. M. ter die sum.

24th. Better. Continue the mixture and powders.

28th. Still some discharge.

Tinct. canth. ♏xii.; dec. pareira brav., ℥i. M. ter die sum.

30th. Continue.

April 4th. Continue.

11th. He is still pale and weak; there is now scarcely any progress made.

Rep. pulv. Mist. ferri c. ℥i. ter die.

A piece of blue ointment the size of a nut to be rubbed into the perineum every night.

13th. Still the same.

Go on with the medicine, and take two pills of turpentine and strychnia every night.

15th. Great improvement. Continue.

On the 20th, as some discharge still seemed to linger about him, I ordered another blister to the perineum. This was quite effectual. I saw him some weeks after, and found he had had no discharge since.

There is, I believe, nothing novel in the idea of blistering the perineum for gleet, and I have merely added this case for the sake of distinguishing this form of gleet, both in diagnosis and treatment. Want of space, rather than want of material, compels me to stop here; but I cannot lay down my pen without expressing a hope that the subject will not be lost sight of.—*Med. Times, Sept.* 20, 1851, *p.* 303.

# MIDWIFERY,

## AND THE DISEASES OF WOMEN.

### 139.—CASES OF INVERSION OF THE UTERUS.

By Dr. Samuel Merriman, London.

[Dr. Merriman has described the six following cases as instances of recent inversion; and thus records his opinion as to the cause. He says:]

It has been generally supposed that this calamitous accident is caused by the rashness or hasty intermeddling of the midwife with the afterbirth, and, no doubt, it has often been caused by such mismanagement; but evidence is to be found which warrants the belief, that some affection or peculiarity of the uterine system itself contributes its share to the occurrence. In the six cases about to be recorded, only one was in the practice of a widwife; the other five instances were, from the beginning, treated by practitioners of unquestionable experience, watchfulness, and caution, yet the life of each patient was suddenly placed in great jeopardy and hazard. These cases I now present, the two last indicating a condition of the uterus which I do not recollect to have heard of or seen described, as connected with inversion, but I was once called to a case of ruptured uterus, in which a very similar kind of soft, flabby, pulpy texture existed, and the rupture appeared to have taken place during a pain of unusually low power.

*Case* 1.—Mrs. E. was delivered of her first child in January, 1802, after a favourable labour by a midwife of much practice. Some little time after the child was born the midwife gently, as she asserted, tightened the navel string to remove the placenta, when a very violent pain came on, and the uterus was completely inverted with the placenta attached. On this my friend, the late Dr. Seares, was sent for, who desired that my assistance should likewise be obtained, and I arrived in less than half an hour after the accident had happened. We found that the body of the uterus, with the placenta adhering, was lying without the os externum; blood was flowing profusely from the uterus, especially from those parts whence the placenta was detached; and the woman was in such an exhausted state as made us doubt whether she would survive till the uterus could be replaced. As no time was to be lost, Dr. Seares carefully removed the partially adhering placenta, and replaced the uterus within the vagina, while I was laying bare my arm; I then introduced my hand, carrying the fundus uteri before it, till I had passed my arm quite to the elbow within the vagina; at this moment I found the fundus uteri spring* from the back of my hand, and the os uteri begin to contract. I therefore cautiously withdrew my hand, and soon had the satisfaction of finding that the hemorrhage had ceased. Mrs. E. was in a state of syncope during the whole operation, but on our giving her wine and other cordials she revived, and afterwards recovered perfectly. She has since borne children, and never experienced any inconvenience from this alarming and dangerous accident, unless an attack of hemorrhage during parturition, five years afterwards, when in labour of her third or fourth child, can be attributed to the occurrence.

*Case* 2.—Nov. 16, 1815. I was requested to visit the patient of a surgeon, who had been extensively engaged in midwifery practice. On my arrival, Mr. —— stated that he had been called the day preceding to his patient, in her second labour, which was favourable and not of long continuance. After the birth of the child he waited for pains to expel the placenta, but as no uterine action came on, he at length deemed it necessary to remove it by manual assistance. He told me, that, instead of endeavouring to loosen the placenta by drawing at the funis, he judged it to be a safer course to assist the delivery of the after-birth by introducing his hand into the uterus, and he did so in this case; unfortunately, the adhesion being firmer than he had expected, he had the mortification and dismay of finding,

* The late Dr. Squire, of Ely-place, thus describes the same sort of "spring." "By keeping a steady firm pressure at the fundus, the uterus passed gradually before my hand, but when getting just above *the* arch of the pubes, it shot up suddenly with a kind of spring."

that, as he withdrew his hand, he had inverted the uterus and grievously imperilled the life of his patient. With as little delay as possible he separated the adhering portion of the placenta, and placed the uterus within the pelvis, preparatory to employing means to re-invert it; but the poor lady became so faint and exhausted, that it was considered necessary to defer this part of the operation till, by cordials and restoratives, she could be somewhat recovered. Whether it would have been practicable to re-invert the organ under this state of exhaustion, or whether it would even have been justifiable under such circumstances to make the attempt, it is now useless to inquire. But it cannot be too urgently impressed upon the mind, that one of two consequences must follow, unless the complete re-inversion of the uterus is soon effected,—either the profuse hemorrhage will destroy life, or the hemorrhage will be stayed by the contraction of the uterus in its mis-placed condition; and this contraction, which prevents the further loss of blood, will also render impossible the re-inversion of the womb. This unhappy event occurred here. An attempt to reduce the inversion was made that same evening, but it was ineffectual. It was then hoped that, if good quiet sleep could be procured, the contraction of the uterus would be less firm in the morning. A dose of laudanum was therefore given to procure quiet sleep and composure. Early the next morning more steady and determined efforts were made, but all in vain, the uterus was too compact to be indented.

About the middle of this day my assistance was sought for, nearly twenty hours after the occurrence of the accident, and I likewise endeavoured to mould the parts, and to press the fundus upwards, but all in vain; I could not make the slightest impression on the solid substance. Finally, we were compelled to draw consolation from the reflection,—the only consolation that remained,—that, although this insurmountable calamity had deprived a young and amiable woman of the most distinguishing privilege of her sex, yet her life had not fallen a sacrifice.

Several years after this event, and after Mr. ——'s death, I heard from the medical attendant of this lady that she was still living, and had suffered less from debility and the usual enervating consequences of such a misfortune, than most others who have been so sadly afflicted.

*Case* 3.—Oct. 31, 1821. Mrs. H——, of Clarges-street, a hard-working woman with several children, was delivered of a large child, after a labour of no great severity or duration, by a very cautious and experienced accoucheur. Soon after the birth of the child, a strong forcing pain came on, and she cried out that something very large had passed from her. Attention being immediately paid to this, it was discovered that the uterus, with the placenta closely adhering, was inverted and expelled without the os externum. In this emergency I was sent for, and, having satisfied myself that this was the poor woman's condition, I proposed to my friend that we should avail ourselves of this opportunity of ascertaining whether it would be advantageous to reinvert the uterus without first removing the placenta, and, as he concurred in my suggestion, we immediately proceeded to put the plan in practice.

We soon found that this was not so easy an operation as we had expected; all our endeavours were useless; we could by no means return the bulky mass within the os externum. Unwilling, therefore, to risk anything by delay, we peeled off the placenta, and then without much difficulty, replaced the uterus in its natural position. In this case I did not discover that "spring" from the hand, on re-inverting the uterus, which I have mentioned in the first case, but I retained my hand within the womb till I found it duly contracting, when I withdrew it, and all did well.

Considerable, but not excessive hemorrhage attended this accident; the poor woman required brandy and other support on account of faintness, but recovered more speedily than, from her condition in life, and the want of many comforts, might have been expected.

*Case* 4.—March 4, 1822. I was sent for to see Mrs. G—, in Piccadilly, who had been delivered in this her first labour of a fine living child. The cause of my being desired to see the patient was, that on her medical attendant attempting to ascertain, in the usual space of time after the birth of the child, what was the state of the placenta, it appeared, on tightening the funis, to be so loose and low in the vagina, as to give assurance that it might be at once safely withdrawn. When, however, traction was made for this purpose, a mass, much more compact than the

after-birth, was brought without the os externum. Mr. —— soon became convinced, on careful manipulation and consideration, that this was a portion of the uterus adhering to the placenta. The examination I made led to the same conclusion; it was, in fact, a partial inversion, or intro-susception, not, however, produced as such intro-susceptions usually are, by a depression or sinking in of the fundus uteri, but a protrusion caused by a spasmodic or cramped condition of the distended uterine parietes, or possibly from the entire suspension of uterine action.

The present case offered a more favourable opportunity than the last, for making the experiment of returning the entire mass, before effecting the separation of the placenta; but my experience on that occasion did not encourage me to recommend a second trial. We, therefore, first removed the placenta, and afterwards had little difficulty in carrying back the protuberant uterus, and replacing it safely in its pristine condition.

Much faintness and debility occurred in this case from rather profuse flooding, but the patient was supported by wine and other nutriment and cordials, and ultimately recovered perfectly.

*Case* 5.—Jan. 21, 1831. I received a message late in the evening, to make a visit three or four miles off, to the wife of a clergyman, who had been delivered, by a very able practitioner, of her first child, after a tedious and hard labour, followed unfortunately by an inversion of the uterus, with adhering placenta. The hemorrhage was profuse, the patient much exhausted and full of alarm; and her father, an old and much esteemed medical friend, who had been present all the time, overcome with apprehension and fatigue, was most anxious that I should be sent for. Meantime the accoucheur in attendance on the patient had with great circumspection and caution kept watch over the case, and had, as much as possible, soothed and tranquillised all parties. He had supplied cordials and nourishment, had removed the adhering placenta, had lessened the hemorrhage, and deposited the uterus within the vagina; everything, indeed, except the re-inverting of the organ, had been accomplished before my arrival. On examination of the patient, I found that the pulse had recovered some degree of firmness, and that the hemorrhage was not very profuse, but that the uterus, in a very soft pulpy state, had escaped without the os externum.

At the desire of the patient's father, and with her medical attendant's approbation, I proceeded with as little delay as possible to re-invert the uterus, and found this a most difficult operation, from a cause altogether different from what I had ever before experienced, viz., an extreme tenuity of the substance of the uterus, and the size of the inverted bag. I was obliged to mould the uterus with my fingers, to grasp it in my hands, and to press it in various ways, before I could effect the reduction. At one time I feared that I must give up the attempt in despair, but at last I had the happiness to effect the entire re-inversion. Once or twice, from the very flabby attenuated condition of the uterine parietes, it seemed as if my fingers must unavoidably perforate its substance, as it did not possess the slightest degree of firmness or contractility.

This lady remained weak and delicate for a long time, but ultimately got quite well. In about two years she had another child, and suffered greatly from profuse hemorrhage, with adhering placenta, but there was no inversion; and from this likewise she perfectly recovered. However, the peculiarity in the condition of the uterus proved ultimately fatal: for the lady's husband having been presented to a living in the country, she went thither to reside, and I learned from my worthy old friend, her father, that her labour in the country was similar to her first, with hemorrhage and inversion, which proved speedily fatal: but with the full particulars of the case I was never acquainted.

*Case* 6.—April 13, 1838. In the afternoon of this day I was called to a case bearing many points of similitude to the last. It was the patient's second labour, and a healthy child had been born by the natural efforts, shortly after which the attending practitioner's attention was directed to her, by her crying out that something was passing away from her. This proved, on examination, to be the uterus inverted, with profuse hemorrhage, and with the placenta still adherent: without delay the placenta was peeled off, and the uterus immediately re-inverted. In this condition, however, it did not remain, but was speedily expelled again in a state of inversion. It was just about this time that I arrived, and found the uterus in a

state of great tenuity and flabbiness of texture. It was again re-inverted, and restored to its proper position, and was with some difficulty retained *in situ*, perhaps somewhat contracted; but the patient was so much spent and exhausted, that, notwithstanding every possible appliance we could make, or means we could devise, she survived only about an hour. A firmer and more contractile disposition of the uterus in this instance, would probably have preserved a most valuable life. —*Med. Times*, *July* 12, 1851, *p.* 36.

[Dr. Merriman makes a few remarks upon the treatment of this condition of the uterus, because, in the third edition of his 'Synopsis of the Various Kinds of Difficult Parturition,' he spoke approvingly of a mode of treatment which in the fourth he condemned, as in a recent case it had altogether failed. He says:]

I take the liberty of quoting the words used by Dr. E. Smith, in commenting on "A Fatal Case of Inversion of the Uterus with attached Placenta," at a meeting of the Medical Society of London, May 17, 1851: "Dr. Denman and Dr. Burns advise that the uterus, with the attached placenta, be returned. Dr. Merriman also gives the like advice, but he mentions an instance in which he first detached the placenta, and the patient did well. It is highly important that some definite rule should be laid down by the profession; for if it be judged best to detach the placenta, it will be injurious to lose time in endeavouring to return it; or if it be deemed proper to return the mass, it cannot be right to run the risk of alarming hemorrhage by first detaching the placenta."

In this conclusion I quite agree, as far as it is possible to be definite in such a case, consistently with the privilege which must be conceded to every competent practitioner, of being influenced in the treatment of each case by the peculiarities which such case presents; and I hope that the words in the above extract, "Dr. Merriman gives the like advice," fall under this category.

The advice or counsel which my volume gives, is to be found in the following extract:—"The presence of an inverted uterus being ascertained, it becomes the accoucheur to use the most prompt and decisive means of relieving his patient, and this can only be done by immediately re-inverting the uterus. To effect this, he must first return the uterus within the vagina, then, having his arm bare and well smeared with lard, he must pass his hand through the os externum, and resting the backs of his folded fingers against the fundus uteri, he must carry it forward till he finds his hand within the cavity of the uterus; and still pursuing his object, he must push his hand onwards till he is fully satisfied that he has completely re-inverted the uterus, and that the contraction of the os uteri will prevent any further mischief." p. 150. This is the sum and substance of my advised and deliberate recommendation; but in commenting upon this, and in deference to the expressed opinion of Dr. Denman, who had favoured me with many conversations on this and other points connected with midwifery, I was induced to add, inconsiderately I admit, these words, "I think I should not in future remove the attached placenta till after the uterus was restored to its right position."

It was not long before I had an opportunity of testing this method of procedure. My volume was published in 1820, and in 1821 I was sent for by a friend to the case above alluded to, where I found the uterus inverted with the placenta adhering. I did not hesitate in proposing the method suggested, and my friend and myself made attempts, as long as we felt justified, to re-invert the uterus without separating the placenta, but all in vain. We were, therefore, under the necessity of detaching the placenta, and the reduction of the inversion was speedily effected, and the patient perfectly recovered.

To my friends, to the gentlemen who were attending the lectures in Medical Societies, and wherever I was able, this case of failure was made known; and when a fourth edition of my 'Synopsis' was required, in 1826, the following passage was inserted at p. 158, viz., "In the last edition of this work, the following was the opinion which I gave upon this subject, viz., 'In a case of this kind, which occurred in my practice, the placenta was removed without prejudice; but I think I should not in future remove the attached placenta till the uterus was restored to its right position.' Subsequently, however, to my last edition, I was called to a woman with an inverted uterus to which the placenta adhered. I tried to effect the reduction without removing the placenta, but could by no possibility accomplish it till I had first separated the placenta. This being effected, I succeeded to my entire

satisfaction in re-inverting the uterus, and the woman has since had two children born without accident or inconvenience."—*Med. Times, June* 21, 1851, *p.* 681.

[The following is an interesting case of inversion of the uterus, communicated by R. W. Nelson, Esq., M.R.C.S.E., of Sydney, New South Wales:]

L. M. W., æt. 22, of a stout, robust constitution, was taken in labour at two o'clock a.m., on Saturday, April 5th, 1851, of her first child. She was attended by a midwife; presentation natural, with a large roomy pelvis, parturition proceeded favourably until half past ten a.m., when, with one violent expulsive effort, the child was born, bringing with it the placenta and the uterus inverted. I saw the case in about half an hour afterwards, when I endeavoured to return the uterus, but could not. I then separated the placenta, and again endeavoured, but it was useless. The pain caused by the effort was very great, and the patient was rapidly sinking. She died in an hour after delivery; the funis was not more than nine or ten inches long; the infant was small, but not unusually so, and alive. The patient complained of great pain above each hip. She appeared to sink from the shock, for there was no hemorrhage.

[At a meeting of the Pathological Society of London, Dr. West exhibited a specimen of]

*Chronic Inversion of the Uterus*, which caused death, in consequence of frequently recurring hemorrhage, twenty-nine months after its occurrence.

The patient, aged 29, first came under Dr. West's notice in January, 1850, fourteen months after her fourth labour.

She had been married seven years; all her labours had been natural and quick; but her last was attended immediately after the extraction of the placenta, with a very violent hemorrhage, which occasioned syncope, and which was accompanied with the appearance of a tumour beyond the external parts. This was attributed to a forcible attempt to remove the placenta made immediately after the expulsion of the child.

The tumour was replaced in the vagina by the medical attendant, and she experienced no further inconvenience until a week after, when the tumour again projected externally, and was once more replaced; since which it never projected outwardly, though it was often just within the external parts.

She suckled her child for thirteen months. for the first ten months she had no ailment, but at the eleventh month menstruation came on very profusely: it recurred still more profusely at the 12th, and even more at the 13th period.

She was in the hospital at her 14th period: its abundance was checked by the matico; but, at her 15th period, and on one or two subsequent occasions, it became necessary to plug the vagina.

The uterus, at the time of her admission, was found entirely inverted, with the exception of the os, which, however, did not constrict the organ at all, but allowed of the easy introduction of the finger between it and the uterine wall. Attempts to revert the uterus, one hand being introduced entirely into the vagina, while firm pressure was made with the other on the pubes, were made both by Mr. Stanley and Dr. West, without success.

The uterus when touched, always showed a very low degree of sensibility. She refused to submit to the removal of her uterus by ligature, and, for a time, she decidedly gained ground; matico, both internally and as a lotion, checking the menstruation and restraining the hemorrhage very greatly; while, under the use of preparations of iron, she gained strength in the intervals. In September, 1850, this improvement ceased; and, though there was no great increase of hemorrhage at the menstrual periods, yet there was an almost constant oozing of blood, in the intervals of which she was greatly exhausted, and the return of each menstruation left her weaker than before. She died on April 19th, 1851, utterly anæmic; the discharge from her vagina having for some weeks been almost entirely serous. A considerable quantity of transparent serum was found in the abdominal cavity, but all the organs were drained of blood.

The uterus was completely inverted; the peritoneum, just at the point of inversion of the uterus, had lost its transparency, and was thickened and uneven; but there were no other traces of inflammation or its results. The insertions of the uterine appendages were drawn down into the cul-de-sac formed by the inverted

uterus, the contraction of which had been so considerable that it would not have been possible to introduce into it any body larger than a quill.

The openings of the Fallopian tubes into the uterus could not be discovered on its inverted surface. The epithelium, as ascertained by Dr. Kirkes, was cylindriform, but destitute of ciliæ. The cylinders apparently atrophied. The tissue of the uterus was unusually dense, but not otherwise altered.—*Med. Gazette, June* 6, 1851, *p.* 1005.

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140.—*On Fissuring and Laceration of the Structures of the Perineum and Cervix Uteri in Natural Labour.*—As the result of a long series of observations, Dr. Simpson has drawn the following conclusions:—

I. Fissuring and laceration of the cervix uteri and perineum are not, as is generally conceived, rare lesions during labour; on the contrary, they are very common occurrences; especially in primiparous labours.

II. These lesions are not, as has been often alleged, necessarily the result of mismanagement, but they occur constantly in practice, despite every modification of management; and in cases also in which no kind of management has been adopted.

III. Evidence of the great frequency of laceration of the anterior structures of the perineum is furnished by,—1. Almost every careful autopsy of women after delivery, whether assisted or not assisted during their labour; 2. By the contracted or shortened state in which the perineum is almost always found, when vaginal examinations are made for uterine disease in women who have borne a family; and, 3. By the fissuring or laceration itself being usually traceable (under careful tactile examination), particularly in first labours, when that examination is instituted in the interval of pain, immediately before the passage of the child's head, or after its birth.

IV. Lacerations of the perineum may be often felt beginning in the form of slight roughish rents or fissures upon the mucous surface of the perineum, and these may extend either backwards or forwards; and if they extend forwards, they at last run over the edge of the perineum, and along its cutaneous surface; the mucous and cutaneous structures of the perineum being thus sometimes lacerated, while its middle, cellular, and fascial tissues are comparatively entire, or at least not so deeply and extensively injured.

V. The proper management and support of the perineum no doubt modifies and diminishes this form of perineal lesion; but it fails far more frequently than is generally supposed in entirely preventing it.

VI. The evidence of the frequency of fissuring of the os and of the lower or vaginal portion of the cervix uteri is the same in character, and consists principally —1. In the frequency with which slight laceration of the edges of the os, and of the mucous and middle coat of the cervix, is detected in autopsies after natural labours, and particularly with first children; and, 2. In the permanent marks of its previous occurrence, as exhibited in those cicatrices and irregularities of the cervix uteri, which anatomists have long empirically, but correctly, laid down as proofs that they, in whose bodies they are found, have been previously mothers.

VII. Fissures and lacerations of the vaginal portion of the cervix uteri not unfrequently occur to a very considerable extent, in cases in which the tissues of the cervix have been rendered rigid by previous inflammation, by carcinoma, or by other morbid causes; and, in such cases, this fissuring or laceration, if limited to the lower or vaginal portion of the cervix, seems to be accompanied with little or no danger.—*Monthly Journal of Med. Science.—London Journal of Medicine, September*, 1851, *p.* 847.

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## 141.—ON OVARIAN IRRITATION.

By Dr. Fleetwood Churchill, M.R.I.A., Hon. Fellow of the College of Physicians of Ireland, &c.

[The chief characteristic symptom of ovarian irritation is an uneasiness, or even pain, sometimes severe, in one or both—frequently the left—iliac or inguinal regions. It may be dull and constant, or it may be acute and occurring in parox-

ysms, aggravated by standing, and generally by walking. There is also, generally, a sensation of fulness about the iliac region, and always considerable tenderness. The irritation may extend to the bladder, exciting a desire to evacuate its contents frequently, causing great pain in doing so. Hysterical paroxysms are by no means unfrequent in subacute ovaritis. Dr. Tilt remarks that the ovaries are more or less painful on pressure, and that they are from twice to four times their original size. Dr. Churchill considers this as a proof of the affection under consideration, not being the same as that described by Dr. Tilt.]

These are the principal local and direct symptoms I have observed; they vary much in degree, and are in some cases so intense as to resemble an attack of acute ovaritis. They differ also more or less according to the circumstances in which the attack occurs; and in order to elucidate this point, I shall briefly enumerate the circumstances.

1. In patients who suffer occasionally from amenorrhœa, it is not uncommon to find ovarian irritation at these periods, and not altogether confined to them. Whether the ovarian irritation be the cause of the suppression of the catamenia, or merely a symptom, is a question not easily decided. In many cases I think it is probably the primary affection, but in some others it appears to be the result of the amenorrhœa. The suffering is often considerable, and may be prolonged until the next catamenial evacuation: if that be full and free, the pain and tenderness generally disappear.

2. Upon the sudden suppression of menstruation, it is not unusual for the ovaries to be almost instantly affected, either by the form of disease I have detailed, or by an acute inflammatory attack, which is more rare.

3. In dysmenorrhœa there is more or less ovarian irritation. If we examine the patient minutely as to the seat of the pain during the period, we shall find that it is principally in the region of one or both ovaries and often accompanied by tenderness on pressure. In the majority of these cases I am inclined to think that the ovaries are secondarily affected.

4. In menorrhagia, the ovaries may apparently preserve their integrity for a long time; but if the attacks be frequent, I have generally found that these organs, one or both, become affected, and that the irritation frequently continues long after the discharge has ceased.

5. I have repeatedly seen this ovarian irritation accompany congestion and erosion of the cervix uteri, but it most frequently comes on after the latter disease has persisted for some time, or after it is nearly or quite cured. The ovarian irritation, however, in these cases, very soon subsides.

6. I have already mentioned its occurrence in hysteria, both when the latter is dependent upon catamenial disturbance, and when the periodical discharge is quite correct.

7. In some few cases I have recognised ovarian irritation in cases where the uterine and ovarian monthly functions were apparently accurately performed, but the patients were of a highly nervous temperament, in delicate health, and without offspring.

These various classes include, I think, all or nearly all, the examples of the disease which have come under my observation. In many cases it requires care to separate the ovarian symptoms from those caused by the concurrent disease, but in other instances this distinction is quite obvious. When uncomplicated, the disorder rarely gives rise to any general or constitutional symptoms. Many of the subjects of it are delicate and weak, and of course this attack keeps them so; but ordinarily the pulse is not quickened by it, and there is neither heat of skin nor thirst. The appetite is seldom good, but it is not worse than usual, and the bowels are generally irregular. I have examined the urinary secretion, and have repeatedly found it scanty, acid, and occasionally mixed with mucus.

As to the *pathology* of this affection there are several points of considerable interest. I think we can entertain no doubt that the ovaries, one or both, are the seat of the irritation; the peculiar and fixed locality of the pain, and its frequent connexion with the ovarian function of menstruation, all confirm this view. But the next question is more difficult to decide positively, viz., is the disorder an inflammatory affection of the ovaries, either acute or subacute? The disease described by Dr. Tilt certainly presents characteristics of inflammation, which I

have never observed in the present disorder. The absence of tumefaction generally, and of a distinct tumour always, the negative results of an examination *per vaginam* and *per rectum*, the intermitting and paroxysmal character of the attack, the absence of all the ordinary results of inflammation (as abscess, accumulation of fluid, &c.), even in the severer cases, and the success of a certain line of treatment, are all, to my mind, very strong arguments for the non-inflammatory nature of the disease. In most of these particulars, it differs from the subacute ovaritis of Dr. Tilt. I have certainly seen some cases in which the point seemed doubtful, and it is probable that the one form of disease may, under certain circumstances, merge in the other; but I cannot resist the conviction, that the affection I have described is essentially neuralgic, and not inflammatory.

Again, it may be asked, is this ovarian irritation the cause of the menstrual disorder or its effect, or merely a concomitant symptom? No one acquainted with the present state of ovarian physiology could deny that the integrity of the menstrual function must be largely influenced by the condition of the ovaries. If this ovarian irritation always preceded the catamenial period, I should be inclined to attribute to it the subsequent distress; and in many cases it appeared to me that I could so trace it as the chief cause. But in some cases, the ovarian irritation distinctly followed the menstrual disturbance or came on towards the termination of the monthly period; and lastly, in other cases, the irritation existed with no catamenial derangement at all. Without doubting, therefore, that ovarian irritation may disturb the menstrual functions in various ways, I cannot agree with those who think that it invariably does so, nor yet with those who are inclined to attribute all menstrual disorders to deviations from the normal condition of the ovaries.

I need not occupy time by enumerating many *causes* for its production: all those which act either upon the uterus or ovary and disturb their functions, may be considered as causes of ovarian irritation; and among these the most frequent, probably, is cold.

I believe that, in many cases, excess in sexual intercourse has given rise to it; and I am also inclined to think that, in a few cases, I have known it originate from the entire deprivation of that stimulus. For some valuable remarks upon this subject I shall refer my readers to Dr. Tilt's excellent work, a review of which appeared in a late number of this journal: all that he says upon this point is, I think, equally applicable to ovaritis and ovarian irritation.

The circumstances under which the attack occurs, I mean its relation to the menstrual functions, the symptoms, and the peculiar locality of the pain, render the *diagnosis* tolerably easy in most cases. It may, certainly, be mistaken for intestinal irritation; but, in general, there are no other symptoms than the pain to justify such an opinion. The bowels, even if irregular, are free from irritability.

It will, however, require a little more trouble to render it certain that there is not acute ovaritis, which the tenderness might lead us to suspect. But this tenderness is *generally much greater than that resulting from inflammation;* it is a kind of a nervous tenderness which shrinks from the weight of a finger as much as from severe pressure. Moreover, in acute ovaritis, the organ is always swollen and enlarged, and it can generally be felt distinctly to be so by an internal examination.

In phlegmonous inflammation of the uterine appendages, or pelvic abscess, as it has been termed, the hard and painful tumefaction is quite plain at the brim of the pelvis, and, therefore, it cannot easily be confounded with the present disorder.

I shall not enter at any length into details of the *treatment* of this disease, inasmuch as I have only my own experience to which I can refer. The choice of remedies will be governed, to a certain extent, by the health, strength, and state of constitution of our patient. With strong, healthy women I have tried leeches to the ovarian region, with some benefit but not complete success, nor in all cases; from six to twelve may be applied at once, and repeated, if necessary, after an interval. Poultices after the leeching are of use; and indeed, when no leeches have been applied, I have seen much comfort and relief derived from repeated poulticing. With delicate women, and they are frequently the subjects of this disease, bleeding in any form has appeared to me rather injurious than beneficial.

I have tried the repeated application of small blisters with better results than

leeching. The irritation of the surface certainly relieves the pain in many cases, and, if continued, may finally cure it; but I must confess I have seen it fail repeatedly.

Anodyne liniments and anodyne plasters occasionally seem to afford relief, but they are of little or no use; I tried anodyne enemata several times with partial success.

In two or three cases, I used the tincture of aconite, applied liberally to the iliac region, but I confess the result disappointed the expectations I had formed.

Having failed in affording any relief in two or three obstinate cases, I determined to try the effect of opium applied to the upper part of the vaginal surface. I accordingly ordered some balls or pessaries to be made, somewhat in the mode of Dr. Simpson's medicated pessaries, each ball to contain two grains of opium, half a drachm of white wax, and a drachm and a half of lard. The whole, when mixed together, formed a ball about the size of a large marble, and I placed it at the upper end of the vagina by means of the speculum, leaving the patient in bed for the rest of the day. The success was quite beyond my expectation; the relief was very speedy, and in most instances complete. Even when the pain did return after a few days, a second application removed it. The tenderness disappeared with the pain, and no unpleasant consequences have resulted in any instance.

I have now tried this remedy in a considerable number of cases, and with almost invariable success. I have rarely found it necessary to bleed or blister since I first adopted this plan; and I recommend it, with considerable confidence, to the profession. I may add that I have tried these pessaries in cases of dysmenorrhœa, applying one the day before the catamenia were expected, with decided benefit.

It is hardly necessary to say that, in this disease, the bowels should be regulated, and gently freed by medicine when necessary. If the appetite is bad, vegetable bitters may be given, and I have generally found it useful to combine some alkali with them.—*Dublin Journal of Medical Science, Aug.*, 1851, *p.* 82.

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## 142.—ANEMIA AS A CAUSE OF DISEASE IN THE FEMALE, AND PARTICULARLY OF PUERPERAL MANIA.

By Dr. F. W. Mackenzie, Physician to the Paddington Free Dispensary for the Diseases of Women and Children, &c.

It is unquestionably a fact, that anemia, in various degrees, prevails very generally amongst females, and that its existence is often unrecognised both by the patient and her friends; whilst, at the same time, its influence is very considerable in modifying and predisposing to various secondary diseases. The great susceptibility of the nervous system in females generally, both consequent upon, and independently of, impregnation and its results, is well known; but its connexion with certain conditions of the blood does not appear to have been as fully appreciated. It has been observed, for instance, that the nervous system of the female in health is far more irritable and susceptible to impression than that of the male; but it is also the case, that the healthy constitution of the blood of the former differs materially from that of the latter, and that, with a slight exception in favour of albumen, the blood of the female contains a smaller proportion of nutritive and vivifying elements than that of the male.*

The avocations of females in many instances, their education and modes of life, more especially of those of the upper class of society, doubtless tend still further to diminish this proportion, and to produce a correspondingly more irritable condi-

* I subjoin the following table from Dr. Carpenter's Physiology, embodying the general results of the analysis of Denis on this point.

| | Male. | | Female. | |
|---|---|---|---|---|
| | Maximum. | Minimum. | Maximum. | Minimum. |
| Water | 805 | 732 | 848 | 753 |
| Albumen | 63 | 48·5 | 68 | 50 |
| Globules | 186 | 110·5 | 167 | 71·4 |
| Fibrin | 4 | 2 | 3·1 | 2 |

tion of the nervous system, as well as a greater susceptibility to the operation of disturbing causes. Anemia, however, when slowly induced, and existing even in an extreme degree, is not incompatible with a comparatively healthy performance of the bodily functions, and thus may have been of long continuance without attracting any particular notice; but persons so suffering readily succumb to morbid influences; they are unequal to much fatigue, possess, for the most part, but little energy, and are often incapable of performing their allotted and ordinary duties. Should impregnation take place under these circumstances, the blood becomes still further impoverished, and the constitutional powers heavily taxed in the performance of the functions necessary for the purpose of "forming, lodging, expelling, and feeding the offspring." If secondary disease has hitherto been averted, there is now a greater probability of its supervening, and hence, during the utero-gestation, various functional disorders are liable to occur. The brain and nervous system in particular become unduly excitable, and, in some cases, incapable of withstanding the shock and the consequences of labour. Hence it is, that intense cerebral disturbance, consequent upon great nervous irritability, is so liable to occur under such circumstances, with or without the supervention of some casual exciting cause.

[Dr. Mackenzie has been led to conclude that there is an undoubted connexion between the existence of anemia antecedently to labour, and the occurrence of mania subsequently, and that this connexion is more than casual. Stout persons as well as spare are obnoxious to puerperal insanity, for a stout adipose subject is not necessarily a healthy one; as the blood may be in such, and constantly is, either impoverished or scanty.]

The existence of anemia cannot be determined by the conformation of the patient. It is rather to be sought for in the pallid complexion, the paleness of the inner surface of the lips, and of the palpebral conjunctivæ; in the frequent palpitation of the heart, the breathlessness on exertion, the abnormal murmurs heard over the heart and jugular veins, the feebleness of the pulse, and the general coldness of the feet and hands: with these symptoms, there is often languor and lassitude, and general feebleness of the bodily functions. These are the surest indications of the presence of anemia; and when they are sufficiently attended to, it will often be found to exist where otherwise it might never have been suspected.

That this condition of the blood should favour the occurrence of puerperal insanity, would appear to be highly probable, from a variety of circumstances. In the first place, it is obvious that for the healthy performance of the functions of the brain, as of other organs, it is necessary that there should be a due supply of healthy arterial blood; and that this supply cannot be greatly diminished in quantity, or deteriorated in quality, without producing disorder, or a great susceptibility to it. "That the brain is an organ receiving a very great supply of blood; that its vessels are large and numerous; that an increased determination of blood to it, or, on the contrary, a diminution of the quantity conveyed to it, must have an effect upon the cerebral functions; and that the perfect or imperfect state of the intellectual and nervous powers is intimately dependent upon the condition of the circulation within the head, are facts of which no doubt can be entertained. Hence, amongst the frequent consequences of anemia, may be mentioned an extremely irritable condition of the brain and nervous system. In some cases, this amounts to actual disorder; in others, to a susceptibility, which only requires some casual circumstance to develope into positive disease. Thus, in puerperal patients, when greatly anemiated, mania may occur as the result of the mere shock and consequences of labour. But when the blood is less impoverished, additional disturbing causes may be necessary; and those which would produce it in a puerperal patient, are similar to those which would occasion it in the non-puerperal state. Of these, mental agitation, shock, or emotion, loss of blood, and irritations of various organs reflected upon the sensorium, particularly of the stomach, liver, and intestines, are the most potential; and the cerebral disorder induced by these in anemiated non-puerperal persons, is precisely similar to the mania of the puerperal state.

In the second place, the general symptoms attending puerperal mania, are identical with those which are met with in anemia. The brain and nervous system, it is true, are in a state of extreme excitement: but the condition of the patient generally is one of weakness and exhaustion. The pulse is small and quick; the

extremities cold; and the excitement has been truly characterised as "action without power." Moreover, in all the cases which I have seen, loud continuous murmurs were heard over the cervical veins, as well as those cardiac sounds which are indicative of an attenuated state of the blood.

In the third place, the progress of the disease does not materially differ from various cerebral affections, which are occasionally met with in anemiated patients; and whilst in each the tendency under favourable circumstances is to recovery, in either the reverse may happen from very similar causes. Thus, in either, congestion of the brain may occur from feebleness or irregularity of the circulation; and, consequent upon this, effusion may take place, leading to a fatal termination. When, again, the malady is protracted, various organic changes may be induced in the brain and its membranes; and these may give rise to permanent insanity, epilepsy, or paralysis.

*Treatment.*—The treatment generally proper for anemia will be found, upon the whole, to be most appropriate for puerperal insanity. Special indications will require to be fulfilled by special means; and slight forms of the disease will often yield to the unassisted efforts of nature. But when the attack is severe, and resists the natural efforts, as well as specific treatment, it will generally be found that this obstinacy is connected with an aggravated form of anemia, and that in proportion as the condition of the blood is improved, will the cerebral disorder disappear.

If the foregoing observations should prove to be correct, and if it should be established as a fact that anemiated persons are especially predisposed to puerperal insanity, it will follow that the treatment should not only be curative, but preventive. The practitioner, aware of the cases in which there exists a predisposition to the malady, will be forewarned, and prepared to take precautions against its accession. During pregnancy, he will endeavour to improve the condition of the blood and the tone of the nervous system, by attention to diet and regimen, and such auxiliary treatment as may be indicated in particular cases. During labour he will especially endeavour to diminish the shock upon the nervous system, and to prevent or lessen excessive or immoderate hemorrhage; whilst, during the puerperal period, he will rigidly guard his patient against the influence of those occasional causes, which are known to determine the attack, such as mental alarm, agitation, or emotion, gastric, hepatic, or intestinal irritation, or any organic irritation which is capable of being reflected upon the brain. In short, the indications are twofold; on the one hand, to adopt such measures during pregnancy as are calculated to improve the blood; on the other, to guard the patient, both during and subsequent to labour, against such influences, mental and physical, as have been known to occasion the attack.

The first indication comprises the treatment of anemia in all its several forms,—a subject which is far too comprehensive and extensive for discussion in the present paper. Its relations, moreover, to uterine and puerperal diseases generally are so important, that I propose to consider it in a separate communication. It should comprehend attention to external circumstances,—habits and modes of life; to the condition of the digestive organs, as well as that of the nervous system generally; to various remote causes of a depressing character, mental and corporeal; and thus should comprise measures both moral and physical, dietetic and medicinal.

The second indication, so far as prevention is concerned, is to protect the patient, both during and subsequently to labour, against the influence of the exciting causes of the malady. These are, for the most part, well ascertained, and comprehend two classes. The first class comprises those which directly operate on the mind; the second, such irritative disorders of the body, or of particular organs, as are capable of affecting the brain unfavourably, whether by sympathy or otherwise. All painful states of the mind should, if possible, be prevented: distress, anxiety, grief, or any emotion, have, in some instances, immediately given rise to an attack of mania; as also have fright, agitation, sudden shock, or alarm. These also should therefore be rigidly guarded against. Of bodily derangements, it may be said, that any "uncommon irritation spreading to the brain," may be the exciting cause; but certain organs sympathise more directly with it than others, and the disorder of these is especially to be attended to. Such irritative disorders may be enumerated in the following order, as regards their frequency, in the causation

of the disease: gastric, hepatic, or intestinal, either singly or combined; uterine and mammary.

The curative treatment of puerperal insanity, should it unfortunately have occurred, is one of extreme difficulty;—not less so from the nature of the indications to be fulfilled, than from the reluctance of the patient to acquiesce in the necessary measures of treatment. It should comprise attention to at least the following four points:

First. The removal of any exciting causes which may exist, and of any bodily derangement which may have been instrumental in the causation of the disease.

Secondly. The subduction of cerebral excitement, and the restoration of tranquillity to the nervous system generally.

Thirdly. Guarding against the occurrence of congestion, effusion, or other diseases of the brain.

Fourthly. Supporting the constitutional powers, restoring the general health, and improving the condition of the blood.

1. The first indication points to the removal of such exciting causes as may have been concerned in the production of the disease. It has been remarked, that these are referrible to two heads: the one operating directly upon the mind; the other consisting, for the most part, of various kinds of irritation in remote parts of the body. When mere emotion has been the exciting cause, and no physical disturbance can be discovered, it is probable that a full opiate, together with extreme quietude, and the constant application of ice to the head, may at once overcome the cerebral excitement, and avert any further bad consequences. It must, however, be remembered that opium is contraindicated, whenever gastro-intestinal irritation exists as a consequence of the presence of crude, unhealthy, or indigested matters in the stomach or intestines. When, therefore, the tongue is furred, the breath unpleasant, the alvine discharges scanty and unhealthy, as also when the abdomen is tumid and uneasy,—evacuant medicines should precede its administration. If gastric disorder exists in a marked manner, there can be no question as to the advantage and safety of giving an emetic, for the purpose of effecting the direct removal of gastric impurities; and ipecacuanha, with squills with or without the tartrate of antimony, according to the strength or debility of the patient, answers well for this purpose. Full vomiting will generally follow its exhibition; and if solid matters, such as undigested food, be not thrown up, there will often be an evacuation of vitiated unhealthy secretion, in large quantity, which will be productive of much relief. Having premised this step, the next should be to act upon the liver and bowels, not only for the purpose of carrying off irritating matters, but of promoting secretion from them, as well as elimination. Calomel and jalap combined, are extremely efficacious for the purpose, and should be given in full doses; but when they fail, or are otherwise objectionable, I believe that croton-oil, with the watery extract of aloes, and a little Castile soap, will be found of signal service. I have certainly found this to answer well in these cases. It also should be given in decided doses, and repeated every four or six hours, until the necessary evacuations have been obtained. These will generally consist of fœtid and unhealthy stools; and, when they have been voided, the symptoms will manifestly improve, whilst the further management of the case will be considerably simplified.

2. The second indication refers to the necessity of allaying the inordinate cerebral excitement, and of restoring tranquillity to the nervous system generally. These objects will be best attained, the former by the exhibition of tartar emetic in small and frequently repeated doses; the latter by opium, morphia, henbane, or some other narcotic. The tartrate of antimony may be given to the extent of one-eighth of a grain every half hour or hour, until the desired effect is produced; and it is sometimes advantageously combined with small doses of the sulphate of magnesia. Any disposition to vomiting may be obviated by the addition of the hydrocyanic acid; and some have found it useful to add a few drops of the tincture, or sedative solution of opium to each dose.

The administration of opium, in these cases, requires much caution, and careful consideration of the circumstances. Opium, I would observe, has a twofold action upon the economy; and each is distinct and dissimilar. Upon the functions of

animal life it operates as a sedative; upon those of organic life, as a stimulant; and thus, whilst on the one hand, it lowers inordinary action of the brain and spinal cord, it tends, on the other, to exalt the activity of the vascular and organic functions. Hence, its efficacy is greatest in those cases in which the sanguiferous system is most depleted, and the vital and organic functions are most depressed; and, conversely, its employment is least proper where there is a tendency to vascular fulness, whether general or local, and more especially of the encephalon. In proportion then as the pulse is rapid and weak; in proportion as organic debility prevails, and there is an absence of cerebral congestion or determination,—is its use indicated in this disease; and whatever may be the intensity of the mental excitement, in such cases it may be given fearlessly and freely. When, however, these conditions do not exist unequivocally, as will happen in the majority of instances, it must be had recourse to more guardedly, and its action modified according to the particular circumstances of each. "Opiates have been given with two intentions," says Denman; "some have merely proposed to soothe and moderate the violence of the disturbance by the frequent repetition of small or moderate doses; others have aimed, by the more liberal use of opium, often repeated, to suppress the irritability altogether. As far as I can judge, the former method is far preferable to the latter; and I think there can be no doubt but that opiates in large doses, instead of diminishing, add, in no small degree, to the irritability which before existed." It is certainly impossible for any one to lay down a rule, applicable to all cases, for the administration of opium, or any other narcotic, in this disease. I have found full doses at bedtime, with smaller during the day, to answer well in some instances; and it is sometimes useful to alternate the use of one narcotic with that of another. Tranquillity and sleep are the great desiderata to be attained; and different medicines, and different modes of exhibiting them, will be required in order to attain this end in different cases. It is, however, most necessary to watch the effect of such remedies, and not to push them beyond certain limits, when their efficacy is questionable, merely in deference to popular custom or opinion.

As auxiliary to these measures, the pediluvium, sinapisms to the calves of the leg, and revulsives to the extremities, may often be had recourse to with advantage. The use of the pediluvium was especially recommended by Dr. Robert Whytt; and he gives, in illustration of its utility, the following case, which would appear to have been one of puerperal insanity. "A lady, aged about twenty, on the fourth day after being delivered of her first child, began to be feverish and slept none. After this she became very delirious, talking constantly, had sometimes tremors, and was so restless, that for two days she had not lain one minute in the same posture, and was with difficulty kept in bed by two or three nurses. On the tenth day after her delivery, when I first saw her, the symptoms now mentioned were all increased, only she spoke none, and seemed to understand nothing that was said to her: her pulse which was but of moderate strength, beat above one hundred and fifty times in a minute,—nay, once, when she was more agitated than usual, it rose to one hundred and eighty strokes in that time, and became withal very small. As she had been blooded, and blistered, and used several other remedies, *without advantage*, I ordered her feet and legs to be put immediately into the warm *pediluvium*, which was done by making her sit up on the bedside. At first it required two people to keep her feet in the water; but in less than a quarter of an hour she grew calmer, and made little motion, either with her legs or any other part of her body. After using the pediluvium for half an hour, she was put to bed, but soon began to grow as restless as formerly; upon which account warm fomentations were applied to her legs and feet, and renewed, from time to time, for near two hours, but without any benefit. I therefore thought it best to renew the pediluvium, which was used, at this time, for a full hour. It soon made her sit quiet; and, after she was put to bed, although she did not sleep, yet she lay several hours without tossing as usual, and her pulse was reduced to 136. As often as she began to be any way restless, the pediluvium was renewed. After using it the fourth time, she got several short sleeps, was less delirious, and her pulse only made 130 strokes in a minute. From this time (viz., the eleventh day after her delivery), the pediluvium which was never repeated above twice in twenty-four hours, produced her longer sleeps, and lessened all her bad symptoms; so

that, in two days more, she was quite free of the delirium, and her pulse did not exceed ninety in the minute."

3. The next indication to be attended to, is to guard against the occurrence of congestion, effusion, or other disease of the brain. Such consequences might frequently be anticipated from the extreme cerebral disturbance going on; but under proper treatment, they are fortunately rare. Nevertheless, the possibility of their occurring must not be lost sight of; and every precaution should be taken to avert them. The state of the circulation in these cases generally forbids the employment of active measures; general blood-letting is, for the most part, inadmissible, and hence abstraction of blood should be limited to the application of a few leeches to the temples, or behind the ears, when circumstances render local depletion necessary; but the constant application of ice to the head, the free use of purgatives, a careful diet, and tartar emetic in contra-stimulating doses, is safer practice, and will generally obviate all danger on this score.

4. The last indication points to the necessity of sustaining the patient, restoring her general health, and improving the condition of the blood. These are matters of the utmost importance; and upon their due fulfilment will her recovery mainly depend. The means to be employed for these objects comprise all those measures of diet and regimen which appertain to the treatment of anæmia. The patient should be placed in a large, cool, and well-ventilated apartment; her diet should be carefully attended to, and this, in the early stages of the disease, should consist of light, unstimulating food, administered regularly and frequently, but in small quantities at a time. While there is much heat of skin, a quick pulse, and great excitement, milk, gruel, arrow-root, and sago, or other farinaceous articles, form the best diet. As the excitement and febrile disturbance subside, a little animal food, or fish, may be added; and, if the extremities should become cold, and the pulse very feeble, wine must be given in addition, and this, sometimes largely. In severe cases, it will be necessary to check the drain upon the system occasioned by lactation; and for this purpose evaporating lotions should be applied to the mammæ, whilst the bowels are kept open by saline aperients. In conjunction with these measures, the patient must be kept perfectly tranquil. All interviews with friends and relatives had better be prevented; conversation should be prohibited; and a regular nurse, accustomed to the care and management of the insane, should be in constant attendance. It is unnecessary to add, that so long as the patient is under the influence of any mental delusion, she must be strictly watched, and everything kept out of her reach, with which she might do injury to herself or others.

Under this system of management, the progress of the case will generally be satisfactory; and, as the general health improves, the mental aberration will disappear. Should it be otherwise, additional measures for the restoration of the health will be necessary. Change of air will prove serviceable, and recourse may be had to tonics in addition to the regimen laid down. Of these, it would be advisable to commence with the mildest,—such as the mineral acids, or some light bitter; and, afterwards to prescribe the more powerful,—such as quinine or some of the preparations of iron.

I conclude, then, by observing, that the relations which subsist between anæmia and puerperal insanity are often of a very intimate nature; and that too much care cannot be paid to the investigation of this point. I do not contend that all forms of puerperal mental disorder are dependant upon anæmia; for I believe that they may arise from other causes, and be connected with other states of the blood:—but I maintain that the asthenic forms of the disease are by far the most frequent, and that of these anæmia constitutes an important pathological element. I believe, moreover, that a careful consideration of this point will often enable us to anticipate and avert the attack, or, when it has occurred, suggest the best method of treatment.—*London Journal of Medicine, June*, 1851, *p.* 505.

## [143.—EVIDENCE OF PUERPERAL FEVER DEPENDING UPON THE CONTAGIOUS INOCULATION OF MORBID MATTER.

By Dr. F. H. Arneth, Vienna.

[The gentlemen forming the medical council of Vienna, on enquiring into the cause of the prevalence of puerperal fever there, were struck with the fact that the mortality was much greater in the wards where the medical students were taught, than in those set apart for the education of the midwives. Dr. Semmelweiss, who was appointed assistant to the Professor of Midwifery, in whose wards this fearful mortality took place, endeavoured to divine the cause of the more favourable state of a neighbouring clinic, but he found that there also no better ventilation existed, nor had any particular plan of treatment been resorted to.]

At length, however, he was struck with what was very likely the sole difference to be found in the management of the two clinics, namely, the pupils of the one being midwives, those of the other medical students. The latter were, almost without exception, in the daily practice of assisting at autopsies, of which eight or ten took place in our large hospital almost every day. The dissections were sometimes executed by the students, or they handled at least the pathological preparations, and examined them carefully. Moreover, the assistant used to lecture on the obstetrical operations. These were performed on dead bodies, and, of course, sometimes repeatedly. Now, after such investigations and such practice, it was not rare to see the students going immediately to the wards of the lying-in hospital, and examining the pregnant and parturient women.

It is scarcely necessary to state, that the pupils of the other clinic, being midwives, did not take any share in the occupations just alluded to; nay, even the assistant of that clinic had comparatively seldom to deal with post-mostem examinations, as it was not a part of his duty to give instructions to the midwives in pathology or operative midwifery.

Having convinced himself that the great prevalence of the disease in his wards was caused by the inoculation of the female genitals, Dr. Semmelweiss began to entertain a hope of being able to diminish this frightful mortality.

Every one who has been engaged on post-mortem examinations must be aware of the very disagreeable smell, which it is impossible to get rid of, even by the most careful washing. Of course this smell which remains about the hands is more penetrating and more lasting the more dissections have been made at a time. The existence of any smell can only be dependent on a substance detained on the epidermis, and is still sensible so long as there remains the least atom of that substance. It is impossible not to recollect how actively the process of absorption, generally speaking, is carried on in the pregnant female.

The opinion of Dr. Semmelweiss on this important matter is as follows: *Any fluid matter in a state of putrefaction*—communicated by linen, by a catheter, by a sponge, by small particles of the placenta, even by the ambient atmosphere impregnated with the foul substances—*may produce puerperal fever.*

If these ideas are admitted, it appears very likely that washing the hands with some powerfully cleansing fluid must destroy the smell, and remove the morbific particles from the hand.

After having tried various substances, he was latterly in the habit of prescribing for that purpose solution of chloride of lime as the cheapest.

In the course of the month of May, 1847, it was arranged that no one should examine any woman in the clinic without previously having washed his hands with solution of chloride of lime, and having made use of a nail brush.

Even in June, it was impossible not to be sensible of the influence of this precaution. Out of more than 300 women that were confined in that month, only six died; in July, three out of about the same number: in August, three; in September, twelve; October, eleven: November, eleven; December, eight; whereas, in April, fifty-seven; and in May, thirty-six, cases had ended fatally. In the year 1848, the mortality amongst the puerperal women delivered by male pupils was 1 in 84; whilst, in the second clinic, amongst the women delivered by midwives, it was 1 in 76.

Since the year 1827, the rate of mortality in the hospital had never been so low. I need not say more, than that from the time when this precaution was introduced

into the practice, up to the time of my leaving Vienna in November last—that is to say, for more than three years—the mortality in the two clinics has always been nearly the same, which had never been the case since 1839—that is to say, since the time when the male and female pupils were exclusively confined to separate clinics.

A very similar observation was made at Kiel. Dr. Michaelis, professor of midwifery in the university of that town, wrote a letter to Dr. Semmelweiss, bearing the date March 18th, 1848, in which he informed Dr. Semmelweiss that they had been obliged, in 1847, (July 1), to shut the lying-in hospital because of the puerperal fever spreading fearfully. In November they opened the doors again, but a very short time afterwards the disease began again to make its appearance—so that they had already come to a determination to close the house for a second time, when the news of Dr. Semmelweiss' opinions, and the measures adopted in our lying-in hospital, reached Kiel (December 21st, 1847). From that time, up to the 18th of March, they had no case of puerperal fever excepting one, that was caused, as Dr. Michaelis believes, by a dirty catheter.

I must call your attention to some more facts which, as it appears, speak strongly in favour of the opinions of Dr. Semmelweiss.

In the course of those years when the post-mortem examinations were less frequent with us in Vienna, owing to the little importance attached to pathological anatomy, the puerperal fever was comparatively seldom met with; and this was certainly not explicable by the wards being less crowded than at present, as the one clinic of those former times contained—in comparison with its room—nearly as many women as the *two* clinics do now. You may recollect that I have stated before, that when first the second clinic was established its pupils included both midwives and medical students, and that in these days the mortality in its wards was not less than in the other clinic. It was only after the separation of pupils already mentioned, that the reports of the second clinic became much more favourable than those of the first clinic. They remained constantly so; with one striking exception, however, occupying the period between 15th October, 1841, and 15th October, 1843, when the mortality was much higher than usual, the then assistant being very busy in anatomical pursuits.

According to the reports of the lying-in houses in the whole empire of Austria, in none of those institutions where midwives have been the only pupils has a puerperal epidemic made its appearance; but it reigned obstinately in Pavia, where they used to dissect—in one of the rooms of the lying-in hospital—the bodies of the children who died in the hospital.

There existed, within the last few years, two clinics in Strasburg, as closely adjacent as those in Vienna, and divided on the same plan in reference to the pupils. The professors of Strasburg told me that they had always less mortality in the clinic to which the midwives were admitted, and that there was no instance of any epidemic in those wards.

While in search of the true cause of the prevalence of puerperal fever, the impression on Dr. Semmelweiss was unfortunately at first exclusively directed to the influence of post-mortem examinations, and the precautions that were already in practice were not resorted to in the case of a pregnant woman who was admitted into the lying-in hospital labouring under cancer of the uterus. As several days elapsed before her confinement was over, and as the case was highly interesting, of course every one wished to examine her. The consequence of this was most deplorable. Fourteen mothers who had been confined at the same time with this woman, and who had been examined by the same students, exhibited puerperal symptoms, and three of them died, although puerperal fever had not been prevailing immediately before, nor did any other case occur except these fourteen.

I think there can scarcely be any doubt as to the mode in which the matters of putrefaction act on the system. All the symptoms that are so often observed in the puerperal fever, and the more so the greater the number of patients at a time is, show clearly that it is phlebitis, ending in purulent infection, with which the women are seized. The rigors, the shivering, that prevail as the first symptoms, the dirty yellow discoloration of the skin, the metastatic deposits that are collected in the cellular tissue and in the articulations, are ascribed by most of the very eminent writers on the subject to purulent infection; and every accoucheur is

aware that those are also the symptoms of the most hopeless cases of epidemic puerperal fever. But allow me to observe that, as far, at least, as I am aware, purulent infection is never met with except in cases where the purulent matter comes in immediate contact with the blood, as is observed in punctures inflicted in dissections, that present quite similar symptoms, and end unfortunately too often in a similar way.

If the discharges of the uterus and the vagina were the true causes of puerperal fever in most cases, it would be decidedly very difficult to say why they did not infect the women in both clinics of the Vienna hospital with equal frequency.

Before concluding, I have only to express a hope that most of the great variations in mortality may be avoided in future by the greatest care after dissections, and by attention to cleanliness, the air of the wards, the instruments, linen, &c.

It is, however, my firm conviction that any individual who may not choose to submit to what we have stated to be necessary after the contact with matters in putrefaction, may artificially produce the puerperal fever on many persons whom he may successively examine, and who, in all probability, would never have become ill but for this inhuman carelessness.

Allow me, in conclusion, to state, that I know of no case of the puerperal fever having been communicated through the clothes of a medical man to a patient. As far as I know, there is no such case on record, neither in hospital nor in private practice in Vienna, where it had been possible to trace a puerperal fever to such a source. As to erysipelas, which I am aware is very often admitted in this country to produce puerperal fever, I feel myself bound to aver that erysipelas has by no means been most frequently observed in the Vienna hospital when we had epidemics of puerperal fever, nor did we find the children of the puerperal women seized with erysipelas. Scarcely one of our pupils, and none of the nurses, were taken with erysipelas during my stay in the Vienna hospital.

I have perused a good many of the histories of puerperal fever detailed in English periodicals and standard works, and I think nearly all the cases brought forward to maintain the possibility of bringing on puerperal fever by touching erysipelas, relate to cases of gangrenous erysipelas; the mode of propagation of which it would be very easy to explain by the views spoken of at length in this paper.—*Monthly Journal of Med. Science, June*, 1851, *p.* 505.

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144.—*Case of Placenta Prævia.*—[A case of this kind having been published by Mr. Nix, Mr. Molloy, surgeon, in a letter to the Editor of the 'Lancet,' says that, though Mr. N.'s practice is excellent, and worthy of all commendation, yet his explanation is erroneous. Alluding to Mr. Nix's description.]

He remarks, "I passed my hand *through the placenta*, and by the feet brought down the child," a method of proceeding which could not have been adopted, simply because it is impossible. Let us examine the case a little more narrowly, and it will become apparent that this assertion is not a truthful expression. The objects for our consideration, and with which we have to deal, are—1, the power—the hand; 2, the resistance—placenta; 3, the fulcrum—liquor amnii and fœtus. Now, if we attempt to force a passage through the placenta, one of two things will necessarily happen; either so much violence must be used as to offer the chance of uterine laceration, by the pressure exerted on the uterus, through the fœtus and liquor amnii; or else, what almost invariably occurs, a portion of the placenta gives way before the direct force employed, and the hand is thus admitted into the uterine cavity. But, for the sake of argument, I will admit that the hand has really made for itself a passage through the placenta, and that one or both feet have been brought through this orifice; let us then inquire what would next take place in the order of events. The placenta is so far elastic as to embrace tightly any considerable object projected through it, and would offer an insurmountable obstacle to the *then* passage of the child's nates and body—moreover, it has become for the time (by being thus situated) a part and parcel of the body of the infant, having only its own adhesion to the uterine walls to oppose to the powerful contractions of the uterus, or the extractive force, or, it may be, both combined. Hence there is no difficulty in concluding that the lesser power—the resistance—must give way

to the greater; and were it even true, as is commonly supposed, that the feet have been brought through a lacerated placenta, the body being unable to pass in this way, the child would necessarily come into the world with the placenta adherent to its legs.

This is the conclusion which all might arrive at by the exercise of a little reason; but in order to make security further secure, let any person place a recent placenta in a wash-hand basin, and try to effect a passage through it, from either the fœtal or maternal surface; he will at once be convinced of the utter fallacy of expecting to perform in the uterus and under unfavourable circumstances, what he is powerless to effect with every advantage in his favour.

I am the more anxious to correct this error because it is one of ancient date, and is repeated in nearly all obstetric works, even in those the latest published. The directions usually given are "that in cases of placental presentation, turning must be accomplished either by passing the hand between the placenta and the uterus, or through the substance of the placenta." Such a statement as this, supported by the names of Drs. Denman, Ramsbotham, Conquest, and others, propagated without inquiry, is received without question, and might be productive of serious results if attempted to be carried out in practice. At all events its detection will leave us to contend with one mistake the less, and at the same time prove a useful hint to the members of the profession generally to cultivate habits of self-thought—self-reliance—in preference to the too exclusive dependence upon the "verba magistri."—*Lancet, Sept.* 13, 1851, *p.* 253.

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## 145.—ON FATTY DEGENERATION OF THE PLACENTA.

By Dr. Robert Barnes, Obstetric Surgeon to the Western General Dispensary, Lecturer on Midwifery, &c.

[Many eminent physiologists agree in the conclusion that fatty degeneration is destined to occupy a very prominent position in general pathology. Its importance and interest is at once shown from its occurrence in such vital organs as the liver, kidneys, heart, &c. There are no sufficient data to establish the opinion of its hereditary nature. But being the organ through which the embryo derives the materials of its growth from the mother, is strong presumptive evidence that the germs of disease circulating in the blood of the mother, may be directly transmitted to her offspring.]

In support of this view, that the placenta may be the medium through which the various morbid diatheses may be propagated from the mother to the embryo, and also as affording further proof that the placenta is nowise exempt from those diseases which affect the permanent organs of the female, it deserves to be remembered, that the placenta may be attacked by inflammation and congestion; that it may be the seat of the deposition of fibrin, cartilage, bone, and even cancerous matter; and the case of a phthisical patient is related, in which small crude tubercles were formed on the external surface of the uterus, under the peritoneum, and eight or ten on the uterine surface of the placenta.

With regard to the frequency of fatty disease in the placenta, it is at present difficult to form an accurate opinion. I am in the habit of minutely examining the placenta on every opportunity; and I have not unfrequently seen fatty masses in various stages of growth in placentæ expelled at the full period of gestation. In these cases it is to be presumed, that the balance of healthy placenta preserved was sufficient for the development of the fœtus. There are certain physiological considerations which render it probable that the placenta is especially prone to become the seat of fatty deposition. The decarbonising function of that organ is one; but there are several others which deserve attention. Pregnancy itself appears to predispose to the formation of fat. The increased proportion of fibrin in the blood; the tendency to albuminous urine; the constant presence of fat in that secretion; the secretion of fat in the breasts; and the observation that a certain amount of free fat is always present in the healthy placenta, constitute a series of facts, which, viewed in their relation to each other, may elucidate those morbid processes which lead to the production of an excess of fat in the circulat-

ing system. Certainly, the elimination of this material from the economy, is obstructed by the encroachment on the cavity of the chest, the pressure upon the liver, kidneys, and other abdominal organs, and the growing disinclination to exercise, which attend the progress of gestation.

The observation of fatty degeneration in the placenta presents another point of interest with reference to the study of the general pathology of that disease. It furnishes an example of the *rapidity* with which it may proceed, which is capable of close limitation. The placenta being a caducous organ lasting but a few months, all the pathological changes observed in it, we know, must have been wrought within a certain brief period of time. When we find, therefore, that the disease has proceeded from simple deposition to degeneration, and even disintegration of the original tissues in a placenta expelled at the seventh month of pregnancy, we are in possession of accurate data by which to form an estimate of the rapidity with which these changes may occur. No similar data can be obtained with reference to the like changes in other organs.

I will not, however, dwell longer upon the general relations of fatty degeneration of the placenta, as I am anxious to advert to the practical bearings of the disease on obstetric practice.

The effects that must result, sooner or later, according to the rate of increase of the morbid alteration of an organ so essential to the fœtus as the placenta, are not difficult to understand. In exact proportion as the growth of the embryo requires a larger and more unimpeded extent of placental structure, in which its blood may be brought into multiplied points of contact with the blood of the mother, large portions of placenta are being gradually rendered useless for this purpose; and the coats of the villi throughout the remainder are probably undergoing a disorganisation which must materially impede the performance of their function, of permitting the interchange of elements between the maternal and fœtal blood. If this conversion of healthy placental structure proceed at such a ratio as to exceed the normal increase of healthy placental tissue, a period must arrive when the healthy portion of placenta will be insufficient for the production of those changes in the blood of the fœtus which are essential to its growth and life. When this period arrives, then, the fœtus will perish, and premature labour will follow—unless, indeed, premature labour be induced during the life of the fœtus by a process to which I will next advert.

One of the conditions essential to the perfect cohesion of the placenta to the uterus, is the preservation of the uniform spongy structure of the placenta. The whole uterine surface of the placenta must present an equal consistence, so that every part may permit of equable distension, whether from the maternal or the fœtal circulating system, and be equally adapted to the opposing surface of the uterus. This condition is necessary to enable it to preserve this adaptation throughout the peristaltic movements to which the walls of the uterus become more and more liable as gestation advances. But when, as is the case in these examples of fatty tumours in the placenta, certain parts of the uterine surface are hard and unyielding, while intervening portions are of a soft and yielding character, the entire placenta is no longer in a condition to follow the movements of the uterus and preserve its connections. The hard portions, moreover, in which fat has occupied the walls of the fœtal vessels, and by pressure obliterated the cavernous structure, no longer maintain any vascular communication with the uterus. The maternal or cavernous portion of the placenta being either closed up, or otherwise rendered useless, the channels of communication with the uterus necessarily disappear. Accordingly, in these portions no oblique valvular openings, no remains of arteries, can be discerned, such as usually exist, and such as were observed on the maternal surface of the more healthy portions of the diseased placentæ. The consequence of this loss of homogeneity of tissue, and cessation of vascular connection with the uterus, is, that when the peristaltic movements of the uterus assume an active character, as they often do towards the seventh month of pregnancy, or even earlier, the cohesion between the placenta and the uterus is soon destroyed at those points where the fatty masses are largest and hardest. This partial disruption can hardly occur without involving some separation of the placenta not diseased, in the immediate proximity of the masses. Hemorrhage results; the effusion of blood and the formation of coagula excite increased action of the

uterus; further detachment follows; premature labour is imminent; and if it ensue immediately, the child may be born alive. But this event may not occur on the first appearance of flooding, as the first case I have related will show. Should it not so happen, the favourable opportunity for the child will be lost. That amount of disease which is sufficient to cause partial detachment of the placenta is scarcely compatible with prolonged life of the fœtus; and in all probability, the fœtus will have been cut off from defective nutrition before a further detachment and hemorrhage could bring about the expulsion of the contents of the uterus.—*Medico-Chirurgical Transactions, Vol.* xxxiv., *p.* 191.

[On the discussion of this subject at a meeting of the Royal Medical and Chirurgical Society,]

Dr. C. J. B. Williams considered that attention should be directed to the nature of fatty degeneration in relation to that class of changes constituting cachexia, and exhibiting itself in a great number of diseases. It appeared, he said, the fashion to regard degenerations as independent changes, and as if fatty degeneration were as worthy to be considered a separate disease as cancer, tubercle, &c.; he said there was a natural tendency of the various products to undergo the change from the albuminous to the fatty. Mr. Gulliver has referred, he observed, to this change in the fatty or atheromatous deposit of arteries, in pointing out the analogy between the chemical formation of the fat and the formation of adipocire. Dr. Quain had fully laid this subject before the Society, but neither the Society nor profession, he thought, appeared to be sufficiently aware that this is a chemical change, and forms a part of the several morbid processes from a degradation or failure in degree of the vital processes; that similar changes took place both in and out of the body when not decomposed; that it always took place in almost every part of the body under degraded nutrition with destruction of material, and in almost all inflammatory diseases; the circulation being obstructed, the nutrition is not developed, and fat is generated. In fibrous membranes, and on the pleura, the microscope showed a formation of fat where organization had not taken place; lymph, if not absorbed or organized, becomes fat. He further observed that blood has been converted into fat, as has been observed in apoplectic clots, and he supposed that in the placenta the circulation becomes obstructed by an inflammatory process. Hypertrophy may result, and from degraded nutrition undergo the change, but this he considered a matter of doubt. This was the original cause of many abortions; in conclusion he referred to the changes observed frequently in the ovaries, where hair and fat have both been frequently observed, and appeared to think that the fatty changes, both in the liver, kidneys, and placenta, might be explained on the view of having not been sufficiently brought under the influence of nutrition.—*Medical Gazette, May* 23, 1851, *p.* 913.

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146.—*On a Form of Sanguineous Pelvic Tumour in Females.*—M. Nelaton calls attention to a peculiar form of tumour, hitherto much neglected by authors. These tumours are usually preceded by some general symptoms, as *malaise*, disturbed menstruation, pains in the hypogastrium, and a feeling as if a heavy body were about to escape from the vagina. The abdomen is sometimes enlarged, and a hard, very painful tumour is felt by the patients in the hypogastric region; in other cases, they are not aware of its existence, and, when it is pointed out to them, they cannot say how long they have had it. On examination, the abdomen is found to be inflated, tense, convex, and painful. The decubitus is dorsal, with the thighs flexed on the pelvis. By palpitation in the hypogastrium, a tumour is felt in the cavity of the pelvis (*petit bassin*). This is sometimes confined within its inner border, and sometimes extends as high as the umbilicus; it is commonly inclined towards the right iliac fossa. The tumour is small, rounded, without knotty projections, and becomes gradually lost in the pelvic cavity; it is scarcely moveable, and is of pretty firm consistence, sometimes presenting fluctuation. On vaginal examination, there is found, between the uterus and rectum, a tumour, advancing towards the orifice of the vulva in proportion to its size. It is smooth, rounded, and fluctuating, varying from the size of a large goose-egg to that of a thumb, without pulsation or expansive movement; it may narrow the vaginal

canal so as only to permit of the passage of the index finger. The uterus may be raised by the tumour, so that its body is felt above the pubes; and its neck may be so much elevated, that the forefinger can only with great difficulty reach it.

The treatment of these tumours consists in evacuating the liquid which they contain. M. Nélaton proposes to employ a large trocar, and then a simple lithotome to enlarge the opening. The patient is placed on her back, on a tolerably high bed, with her legs and thighs bent, as in the position for lithotomy. By introducing a speculum into the vagina, the tumour is discovered towards its base, at the posterior wall. The point where fluctuation is most apparent having been discovered, a long trocar is introduced, with a canula sufficiently long to allow the escape of the matter, which is liquid, black, and viscid, like treacle. The incision ought generally to be three *centimètres* in extent; it should be made in the axis of the vagina, so as to avoid wounding the uterine arteries. It should also be carefully ascertained that there are no arteries on that part of the wall in which the incision is made. The incision should be neither too wide nor too deep, so that the rectum may be avoided. When, some days after the operation, the liquid which escapes has become purulent and fetid, disinfectant injections should be employed. The strength of the patient should at the same time be supported by quinine and other tonics. The walls of the tumour should also be explored with a scoop (*curette*), so as to remove any adherent clots, which may be in a state of commencing putrefaction.—*Gazette des Hôpitaux.—London Journal of Medicine, June*, 1851, *p.* 565.

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147.—*Spontaneous Cure of Ovarian Tumours by Discharge of their Contents through the Fallopian Tubes.* By Dr. James Robertson, F.R.C.S., Physician to the Infirmary, Hitchin.—[The following case occurred to Dr. Robertson some years ago, and to the notes of which he had an opportunity of adding the post-mortem appearances.]

Mrs. ——, a delicate, strumous, married young woman, consulted me in June, 1847, regarding her enlarged abdomen. She said that now her abdomen had enlarged gradually for some months, but more rapidly within the last two months; it was as large as, and of similar appearance to, that of a pregnant woman at her full time. She had menstruated regularly; did not think she had ever been pregnant; passed but a small quantity of milky-looking urine. A fluctuating tumour filled the pelvis, pressing on the rectum and vagina; the uterus was distinguishable, high up, but small. A catheter was passed: the bladder was empty. She told me she had a similar swelling about a year before this time, which ended by an immense discharge from the vagina. She attributed this first attack to over-exertion in walking; her health had been very delicate for some years. She suffered much from dysmenorrhœa. A few days after this, whilst in bed, suddenly a great discharge of most abominably stinking, white, slimy fluid, with a quantity of white and greenish flakes and pieces of bladder-like substance floating in it, enough to fill two full-sized chamber-pots, took place per vaginam. The abdomen resumed its natural size; the discharge in four months diminished to a mere weeping. She now had symptoms of phthisis, and died in September, 1848.

On making examination after death, we found old adhesions plentiful about the lower abdominal and pelvic regions, attaching the various viscera together. In the right ovary was a cyst as large as a medium-sized orange, with a very ragged interior, containing some fluid like that discharged; it was much corrugated and collapsed, and communicated with the fallopian tube, on which were two other cysts of the same appearance as the other, but about one-fourth the size; there was also one cyst, unruptured, as big as a small orange, filled with glairy fluid, in the same ovary. In the left ovary was a cyst of precisely the same appearance as that first described, but empty, communicating with the left fallopian tube. The fallopian tubes were dilated; the uterus was sound, but harder than usual throughout.

The following is somewhat similar, but not so complete:—

Mrs. G——, a cachectic, strumous, married woman, aged thirty-six, not having been pregnant, and who menstruated regularly, observed, about sixteen years ago (*this* was in December, 1848), a fulness in the right iliac region, which had since

gradually become greater, and which, on examination, presented the usual signs of an ovarian tumour, she being at this time as big as if about seven months gone with child. In February, 1849, she found herself, one morning, on waking, in a pool of "blood and matter" up to her shoulders, which had escaped per vaginam. A considerable discharge continued for some time, but in six months had nearly ceased, her general health had improved, and the abdomen resumed its natural size. She is now (September, 1851) in pretty good health, and the contents of the pelvis appear healthy.—*Lancet, October* 11, 1851, *p.* 343.

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148.—*On the Management of Women after the Cessation of Menstruation.* By Dr. E. J. Tilt.—[The superabundance of blood and nervous energy after the cessation of the menstrual flow may be safely and effectually kept down by the habitual use of small doses of purgatives; and, as they may have to be continued for some length of time, it is best to consult the patient as to what medicine would be best tolerated. The purgative to be used depends upon the constitution of the patient. Perhaps the best is some mild purgative which has been found to agree with the patient. Dr. Tilt continues:]

I frequently prescribe the soap-and-aloes pill of the Edinburgh Pharmacopœia, ordering five or ten grains to be taken with the first mouthful of food at dinner. Hemorrhoidal affections I have never seen *caused* by this frequent use of aloes, but I have seen them *relieved* by it; and as I read in Giacomini's 'Treatise of Materia Medica' my experience on this point is confirmed by that of Avicenne, Stahl, Cullen, and his own, so I think there must be some exaggeration as to the extraordinary property generally ascribed to this valuable drug, which can be associated with hyoscyamus, and is thus said to be less liable to induce piles. Kemp and Hufeland recommend the following powder to be given to those who are advanced in years, and who complain of a tendency to vertigo:—Guaiacum resin, cream of tartar, of each half a drachm, to be taken at night. This, no doubt, will sometimes be found a useful laxative; so will the popular remedy called the Ceelsea Pensioner, of which Dr. Paris has given the following formula in his excellent Pharmacologia:—Of guaiacum resin, one drachm; of powdered rhubarb, two drachms; of cream of tartar and of flour of sulphur, an ounce of each; one nutmeg finely powdered, and the whole made into an electuary with one pound of clarified honey: a large spoonful to be taken at night. I generally administer the flour of sulphur alone, or else to each ounce of it I add a drachm of sesquicarbonate or biborate of soda, and sometimes from five to ten grains of ipecacuanha powder. One to two scruples of these powders taken at night in a little milk, is generally sufficient to act mildly on the bowels, and I consider such combinations as very valuable when a continued action is required.

I feel obliged to class sulphur amongst purgative remedies because such is its visible action, but I believe that it owes its chief value, in diseases of cessation, to another action, much more difficult to understand, and which has long rendered it so valuable both in hemorrhoidal affections, where there is an undue activity of the intestinal capillaries, and in skin diseases marked by a morbid activity of the cutaneous capillaries. Whether sulphur cures by acting on the nerves or on the blood-vessels, or by modifying the composition of the blood itself, is difficult to tell, but it does certainly cure the diseases I have enumerated. It forms part of many popular remedies for the infirmities of old age, was recommended by Hufeland, and is lauded by Dr. Day in his work 'On the Diseases of Old Age;' but its utility is not generally known in all derangements of the menstrual function, at whatever period of life they may occur, and particularly at the change of life, where, if required, its action may be continued with impunity for months and years.—*Provincial Med. and Surg. Journal, October* 1, 1851, *p.* 547.

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149.—*On the Obstetric Use of Ergot of Rye.* By Dr. George E. Ely, Rochester.—The case in which ergot is most strikingly beneficial, and I may say most necessary, is that of partial presentation of the placenta. Here, until the os uteri

is considerably dilated, the hemorrhage can only be stayed by the plug, which will do so effectually. But when the os is tolerably open, thin, and soft, the yielding membranes will not afford a counter-pressure to the plug, which is then no longer efficient. They may also give way without our knowledge, and then we shall have internal hemorrhage. If we now rupture the membranes, the descent of the head will so compress the lacerated vessels, as to place the patient in safety. But we cannot depend upon the continuance of sufficient contraction of the uterus to keep up this compression; and the intervals of pain will permit a considerable draining. Here, then, if the symptoms are urgent, there would be no remedy but turning; a measure painful and exhausting to the mother, hazardous to the child, and perhaps difficult to the operator. But ergot supplies, as I can aver, an admirable and a competent aid. Let a full dose be given, and the membranes ruptured, and the happy results will be, a cessation of hemorrhage and a speedy delivery; or, at all events, such a degree of tonic contraction of the uterus will ensue, as will keep the patient out of danger.—*London Journal of Medicine, November*, 1851, *p.* 979.

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## 150.—NEW FORCEPS FOR THE REMOVAL OF UTERINE POLYPI BY THE COMBINED INFLUENCE OF PRESSURE AND CAUSTIC.

By Dr. M. M. O'Grady, M.R.I.A., Malahide.

The difficulties which have occurred to me, in common with the most experienced practitioners, in operating with the instruments ordinarily employed for the extirpation of uterine polypi, induced me to turn my attention to the construction of a forceps by which the operation might be simplified and effectually performed without the necessity of confining the patient to bed, or of exposing her to the risk of being injured by the presence of the double canula in the vagina during the time the ligature takes to cut through the pedicle, or to any of the other disagreeable consequences attending this mode of operation.

Having operated seven times successfully with the instrument hereafter described, without causing the least pain, and without the patients losing a drop of blood during or subsequently to the performance of the operation, I am induced to lay a description of it before the profession; I will also add a brief account of two cases, which suggested to me the idea of its construction, and of combining mechanical pressure with the action of nitrate of silver upon these morbid growths. The instrument was made under my immediate direction, by Thompson & Co., of Henry-street.

The entire length of the forceps is ten inches, and that of the blades, measuring from the pivot to the extremities, five inches and a half, each blade terminating in a semi-tubular chamber, of about half an inch in length, closed and rounded at the extremity, and open on the inner surface, so as to form a groove for the reception of a piece of caustic.* Both these chambers having been charged, and the forceps shut, the caustic is completely enclosed; it is thus introduced into the vagina or os uteri with perfect safety. When the blades are separated for the purpose of seizing the object to be operated upon, the caustic can come in contact only with the substance grasped by the forceps; its action then is two-fold; first, the edges of the caustic chambers break down the vessels of the polypus by compression; and

* I had the portion of the instrument in which the caustic was included made of silver. Platinum or gold would of course answer better; but Dr. Carte suggested to me that a coating of gutta percha would be as effectual, and, I need not say, very much cheaper.

secondly, the caustic decomposes its substance with great rapidity. The forceps is withdrawn as soon as all resistance to its pressure appears to have yielded, and the parts are then washed out with a solution of carbonate or hydriodate of potash, which decomposes the caustic and prevents its acting on the os or cervix uteri. The patient, with the precautions usually adopted, may safely be permitted to walk or drive out, as if no operation had been performed; and at his next visit the operator will find the polypus loose in the vagina, if not already discharged into the night-chair.

*Case* 1.—On the 10th of September, 1848, I was sent for in a hurry to see Mrs. W., aged 39. She was pale and faint from loss of blood. Upon examination, there was a large fleshy mass protruding between the labia pudendi: it bled freely from many points of the exposed surface, and on introducing the finger I found that the tumour passed through the os uteri, and nearly filled the vagina. She could not have lost less than twenty ounces of blood during the last twenty-four hours. She was the mother of six children, and had a bad miscarriage about two years before; she had suffered from vaginal discharge since then, and occasionally lost considerable quantities of blood at the regular monthly periods. Not being prepared for the nature of the case, I had neither speculum nor ligature, and being obliged to act at once to arrest the hemorrhage, it occurred to me to apply to the bleeding surface the nitrate of silver, which I always carry about me, having been in the habit, for at least twenty years, of using it extensively in inflammation of the throat and fauces, and latterly in ulceration of the os and cervix uteri. I was surprised at the rapidity of its action upon the polypus, which it reduced for at least one inch to a black carbonaceous mass. It arrested the hemorrhage instantaneously, and enabled me to leave my patient in a state of security in less than an hour, cautioning her at the same time to send for me if there was the least return of the bleeding. On the day following I found this lady cheerful and in excellent spirits, although naturally weak from the loss of blood. There had been no return of the hemorrhage since I left her. I now introduced Fergusson's speculum, which the polypus filled. Having this shade for the vagina, and encouraged by the result of the application of the caustic made the day before, I destroyed another portion of the polypus in a very short time. Still apprehending a return of hemorrhage, I used the precaution of plugging the passage, but I found this at my next visit to have been wholly unnecessary, inasmuch as not a single drop of blood had been lost. In a week the polypus was destroyed up to the os uteri, which, being in a healthy state, closed upon the remainder.

I mentioned to this lady that the polypus was not entirely extirpated, and that it was likely to be reproduced, and told her in the event of the recurrence of the symptoms, to send for me. I did not hear from her again until the 14th of March, 1849, when I was again summoned to see her. I found her suffering much from bearing down pain, which she had had for the last week, and upon introducing the speculum a polypus was seen, about two inches long, issuing from the os. Having, in the meantime, operated upon another patient with the forceps I have described, I had no difficulty in securing and destroying this polypus within the cervix, from which it grew. The entire operation did not last five minutes, and the lady dined with her family that day. She has since had one child, and has continued to enjoy the best health.

*Case* 2.—In February, 1849, I was consulted by Mrs. M., aged 58. She married young, is the mother of ten children, and had several miscarriages. I attended her in four confinements, the last fifteen years ago. Her general health was always good until the age of 56 or 57, when she had leucorrhœa and pain in her back, with bearing down upon taking exercise. For the last three months the discharge has been more profuse and high-colored, and for two or three days back she bled freely from the vagina. She is now pale, nervous, and very much alarmed about herself. Upon examination, I found a fleshy mass in the vagina, which bled freely from one point. I introduced Fergusson's speculum, by which a polypus at least four inches long, and issuing from the os uteri, was revealed. Having found the nitrate of silver in Mrs. W.'s case so efficient, I applied it freely to this polypus, and with the like happy result; the bleeding ceased at once, and never during the subsequent treatment returned.

Having succeeded in destroying a great portion of the polypus by the caustic,

I repeated the application the next day. The forceps, now rudely finished, and charged with caustic, came to my assistance. With it I seized the remainder of this polypus, at its origin in the cervix from which it grew, and with great rapidity broke it down and reduced it to a black carbonaceous pulp; no blood was lost in any stage of the operation.

As my object in narrating these cases is to introduce this forceps, and the mode of operating with it, to the notice of the profession, I will merely remark, that I removed two more polypi of a similar character from this lady, all of which grew from the interior of the cervix uteri, the last in September, 1850, and that I saw her yesterday, July 16, 1851, in as good health and spirits as ever she enjoyed. She assured me that she has not suffered the least inconvenience or return of any of the symptoms since the last operation.—*Dublin Quarterly Journal of Med. Science, August*, 1851, *p.* 242.

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151.—*Gelatinous Polypus—New Polypus Forceps.*—Mr. HARVEY exhibited to the Medical Society of London a gelatinous polypus, which he had extracted from the ear by a new kind of forceps which he had invented for the purpose. He observed that in these cases it was most desirable that the morbid growth should be extracted entire; for if it was broken or otherwise injured in attempts at its removal, it gave rise to much inconvenience, and required tedious and troublesome after-treatment. The forceps which he had constructed, and which he had been in the habit of using for a long time with satisfactory results, were not dissimilar to those of Assalini, but had a somewhat longer blade, were flattened on either side, and terminated with three rows of teeth. The foreign body was firmly grasped by these teeth, and removed by a rotatory motion, the instrument admitting of that. This Mr. Harvey regarded as of great importance to the operator on the ear. It was also sufficiently small to admit of being used with a bivalve speculum in the auditory canal, the operator being thus afforded an opportunity of investigating the origin of polypi.—*Lancet, Oct.* 25, 1851, *p.* 393.

# ADDENDA.

## 152.—ON THE PHYSIOLOGY AND PATHOLOGY OF THE PHOSPHATE AND OXALATE OF LIME, AND THEIR RELATION TO THE FORMATION OF CELLS.

By Dr. William Beneke, Resident-Physician at the German Hospital, Dalston.

[In a small work lately published in Germany, the author has established the following results:]

1st. Just as in plants and inferior animals the phosphate of lime is indispensably necessary in man for the formation of cells; this formation does not only depend upon the presence of albumen and fat, but likewise upon the presence of phosphate of lime.

2ndly. The want of phosphate of lime, either in plants or animals or men, causes a deficient formation of cells; and a great many pathological states of the system really seem to depend upon a deficiency of phosphate of lime.

3rdly. In accordance with these general laws, we must suppose that we are enabled to cure, or at least to alleviate, by the internal administration of phosphate of lime, diseases marked by emaciation, formation of ulcers, in one word, by a deficient formation of cells.

4thly. I have shown by my experiments, that such really is the effect of the administration of phosphate of lime;—that is to say, I have produced by the internal administration of phosphate of lime, an undoubted increase of the cell-formation in diseases evidently showing a diminished formation of cells.

5thly. As diseases or affections of this kind, which have come under my observation, I have to mention,—

*a.* Ulcerations of any part of the system, which are based upon general dyscrasia, such as scrofula, and which are not merely local affections.

*b.* Infantile atrophy, especially the well-known atrophic state of children, suffering from rickets, and its accompanying symptoms, as diarrhœa, &c.

*c.* Tuberculous disease, more especially of the lungs, in its earliest stages.

6thly. There seems to be a remarkable connection between scrofula and deficiency of phosphate of lime. But as it generally ought to be mentioned, that we shall never be able to produce an increase of the formation of cells, unless we administer a wholesome, preferably nitrogenous diet; so it must be considered that the deficiency of phosphate of lime is only a constituent part of these diseases; and by its mere use we are very well enabled to remove symptoms, which depend on its deficiency, but by no means shall we cure thereby the dyscrasia *in toto*.

[The following is the chief point of the facts on which these conclusions are founded, viz., the great importance of inorganic substances in the formation of organic compounds. Liebig pointed out this fact with regard to the organic compounds of plants, these depending in some measure upon the presence of the inorganic constituents of the soil. And hence we must be induced to suppose that a similar relation exists in animals, and even in men. Dr. Beneke even supposes, that in these organisations the inorganic are quite as essential as the organic compounds.]

It is not here the place to enter more deeply into these views. I have only to show how far we are acquainted with the relation of phosphate of lime to organic compounds, and even to the formation of cells.

In first considering plants, we have been informed by Liebig that the salts of phosphoric acid are indispensably necessary for the formation of nitrogenous compounds as well as of cells. In his elaborate work, 'Organic Chemistry in its Application to Agriculture and Physiology,' the author affords a great many proofs of this result, out of which I beg to select a few. "None of our plants," as we read in page 100, fifth German edition, "can bear perfect seeds—that is, seeds yielding

farina, without a large supply of phosphates, and even ammonia, substances which they require for their maturity. In the stems and leaves of plants we find salts with alkaline bases; the azotic compounds we find always accompanied by salts of phosphoric acid, and we therefore must suppose that they are of the greatest importance in the economy of plants. The alkaline bases are principally wanted for procuring sugar, gum, pectine, and amylum—substances which do not contain nitrogen; on the other hand, the salts of phosphoric acid are principally necessary for the formation of azotic compounds." (p. 251.) These interesting remarks are based upon facts which do not admit of any doubt; they apparently prove the remarkable relation between the salts of phosphoric acid and azotic compounds in plants. But there is another point we have to direct our attention to, and this is the most important with respect to my present purpose. At page 138 Professor Liebig says: "We know that the quantity of starch in potatoes increases when the soil contains much humus, but decreases when the soil is manured with strong animal manure, *although in this case the number of cells increases*, the potatoes acquiring in the first case a mealy, in the second, a soapy consistence. Beet-roots taken from a barren, sandy soil, contain a maximum of sugar, and no ammoniacal salts, and the Teltowa turnip loses its mealy state in a manured land, because all the circumstances necessary for the formation of cells are there united." Well then, we must trace the causes of the peculiar influence of the manure on the formation of cells, and in referring to its constituent parts, and the experiments which have been made on their relative power, we shall be far from admitting the least doubt that the salts of phosphoric acid are those materials, upon the presence of which the formation of cells depends. This view is still farther proved to be correct by our finding that for manure of animal excrements, other substances, containing their essential constituents, may be substituted. "In Flanders (Liebig, 'On Agricultural Chemistry,' English translation by Playfair, 1840, page 182) the yearly loss of the necessary matters in the soil is completely restored by covering the fields with ashes of wood or bones, which may or may not have been lixiviated, and of which the greatest part consists of phosphates of lime and magnesia. The great importance of manuring with ashes has long been recognised by agriculturists as the result of experience. Its use will be at once perceived when it is considered that the ashes, after having been washed with water, contain silicate of potash in the same proportion as in straw, and that their only other constituents are salts of phosphoric acid." Finally, Liebig adds the important remark (German edition, page 245), that we may furnish a plant with carbonic acid and all the materials that it requires; that we may supply it with humus and ammonia in the most abundant quantity, but that it will not produce albumen, fibrine, and caseine, unless the salts of sulphuric or phosphoric acid are afforded to it. "We ought to suppose that without their co-operation, the ammonia does not influence in the least the formation of the nitrogenous substances."

This, then, is the result of the foregoing remarks: that the azotic compounds in plants are not produced without the co-operation of the phosphates; that the produce of cells increases proportionately to the power and quantity of the manure afforded to the soil, and that this power particularly depends upon the presence of phosphates, the other salts really being of no great importance in this respect.

But there are different sorts of phosphates contained in the soil, such as phosphate of soda, phosphate of lime, phosphate of magnesia, and phosphate of iron. Is there any reason to believe one of these several substances to be more important for the produce of nitrogenous substances and cells than the others? Facts are not wanting which afford an affirmative answer to this question. The single experience that we may considerably increase the produce of nitrogenous substances and cells by the manuring the land with ashes of bones, is quite sufficient to prove that the phosphate of lime is of the greatest importance in this respect. A great many analyses of ashes of bones, communicated in the "Annalen für Pharmacie und Chemie von Liebig und Wöhler," by Enderlin, Fresenius, and Will, and the analyses of bones by Berzelius, evidently show that the phosphate of lime is always present in ashes in a certain proportion, according to the nutritive power of the plants and the soil from which they are taken; and that, on the other hand, the proportion of phosphate of magnesia and soda in bones themselves is too small to

partake of the influence exerted upon the soil by manuring it with bones. Berzelius found in 100 parts of dry bones, 53·04 phosphate of lime; 1·16 phosphate (carbonate?) of magnesia, and 1·20 soda, with a small quantity of chloride of sodium.

On these facts, then, I have founded the conclusion, that the phosphate of lime is indispensably necessary for the formation of cells in plants.

With regard to the inferior animals, and the part which is performed in their economy by the phosphate of lime, I have only to mention an excellent paper by Dr. Carl Schmidt, "Zur vergleichenden Physiologie der wirbellosen Thiere. Braunschweig, 1845." In this paper Dr. Schmidt communicates most interesting experiments, from which it becomes evident, that the phosphate of lime has an intimate relation to the formation of cells. Dr. Schmidt ascertained beyond a doubt, that in the articulata the quantity of phosphate of lime increases or decreases proportionately to the quantity of chitin, a sort of colourless, transparent tissue, which is not soluble in water, alcohol, ether, and liquor potassæ, and forms the principal constituent part of the skeleton of all the invertebrata. Now, this tissue is the result of an active formation of cells during the period of changing the integuments in these animals, and so it results that the quantity of cells formed is proportionate to the quantity of phosphate of lime present. The result becomes still more evident from the experiments which Dr. Schmidt describes in the following words:—"By carefully and gradually scraping off the outside of the hard scales of the thorax and of the claws of crabs to the upper pigment-layer of the subjacent membrane, I produced an exudation of new matter. This quickly took place, and, after the lapse of eight hours, a thickish, viscid, transparent mass (cyto-blastema) was to be found. This mass contained a large quantity of corpuscles, which did not dissolve in water, nor in acetic acid (fat), and others, which were soluble in water and acetic acid (albumen). No other corpuscles were present. When this mass was incinerated, a remarkable quantity of phosphate of lime (about eight per cent.) resulted, besides a small quantity of alkaline phosphates and carbonate of lime, the latter being the result of the incineration. The phosphate of lime was held in solution in the mass itself, as was proved by the turbidity resulting from the addition of a drop of ammonia to a drop of the liquid placed under the microscope. After the lapse of fourteen to sixteen hours the soluble molecules (albumen, and very likely phosphate of lime) surrounded the fat-globules, exhibiting in this way globular masses. Some of these masses were covered already by a membrane, so as to form cells, others not. At the same time numerous rhomboidic crystals (carbonate of lime) appeared. By the addition of liquor potassæ a swelling of the cells and their molecular contents took place; afterwards they became transparent and dissolved; the fat-globules were recognised as forming the nuclei of these cells. The cells did not yet present themselves as chitin. But after twenty-four to thirty-six hours several of these cells were extended, spindle-like; they swelled still by the addition of liquor potassæ, but they did not dissolve more in this stage; and appeared to be of the chitinous disposition." These experiments are followed by others which afford a negative proof in favour of Dr. Schmidt's views alluded to. In examining, namely, the calcareous scales of helix, and their interior, transparent, *structureless* membranes, he observed that no phosphate of lime was present, and accordingly no cells were found; nothing could be detected but amorphous, hardened, mucous masses, separated by layers of carbonate of lime. Dr. Schmidt himself says: These observations really are so striking as fully to confirm the opinion before advanced; and he further adds as his firm belief, that a certain combination of albumen and phosphate of lime, or better, that a solution of albumen, which is saturated with the phosphate of lime, is particularly enabled to coagulate by the contact of heterogeneous substances, and to form membranes around them—that is to say, walls of primary cells.

Well, then, having become acquainted with these remarkable facts, I put forward the question, whether the phosphate of lime might not have the same relation to the formation of cells in the higher classes of animals, and even in men, as it has been shown to have in inferior animals and plants? I have been fortunate enough to obtain satisfactory and affirmative results.

The way in which I tried to solve the question was a double one—first, I had to prove that wherever we find a formation of cells, the phosphate of lime

is present, and *vice versâ*, that the phosphate of lime is wanting where no formation of cells takes place; secondly, I had to show that the phosphate of lime is indispensably necessary for, and that it really influences, the formation of cells.

With respect to the first point, I examined a great many pathological exudations, such as the serum produced by blisters, the exudations and secretions of wounds and ulcers, &c. &c.; and I have shortly to state, that wherever a formation of cells took place, the phosphate of lime was found in considerable quantity, and wherever it was absent, I could scarcely find traces of phosphates. In order to detect the smallest quantities of phosphate of lime, I used the microscope, which shows the most beautiful crystals of sulphate of lime, if a preparation, containing the phosphate, is mixed with a small drop of sulphuric acid, and no crystals at all where no lime is present. However, it is requisite, for a microscopical examination of this kind, to be well acquainted with all stages of the formation of the sulphate-of-lime crystals, so as to be enabled thereby to judge whether the quantity of phosphate present is a large or a small one; the former being the case, we shall observe a rapid and splendid formation of large crystals; the latter taking place, only the former stages of the crystal formation are to be detected.

First, I examined the serum which was drawn by blisters. It is rather difficult to detect the phosphate in a single drop of the unaltered serum in the way described, the quantity of lime really being a very small one. However, in a single drop I detected cyrstals of the smallest size, by the addition of sulphuric acid, and by continued examinations, I found that the crystals presented themselves the more quickly and well marked the sooner the formation of pus-globules took place in the serum, which was left beneath the skin. But from twelve to twenty-four hours are often required for the formation of crystals, and the preparation should not be judged of until during the lapse of this time repeated observations have been made. If, on the other hand, I slightly evaporated the serum in a hot-water bath, and now mixed a drop of the evaporated serum with sulphuric acid, a rapid formation of crystals generally took place, which undoubtedly showed the phosphate of lime to be present in large quantity. I then examined exudation-matter of wounds and ulcers, and these observations really afforded the greatest interest; they decidedly proved the relation of the phosphate of lime to the formation of cells. It will be well known to every accurate observer, that during the time of cicatrization of wounds and ulcers, two different sorts of exudation generally take place. First, an exudation appears, which I should like to call "spurious exudation," and which really exhibits nothing but a natural cover for the part affected or wounded, being far different from what we call "spurious granulations;" this exudation is subsequently thrown off; afterwards beneath this covering the real blastema is produced, affording the materials for the tissue which is to be formed, and undergoing the well-known changes to cells, tissue, &c. Well, then, if we examine microscopically what I have called the spurious exudation, we shall observe it to consist of amorphous, structureless masses; no cells are to be detected; it only seems to consist of molecules; no organization takes place. And even in these masses, by the addition of sulphuric acid, I have never observed the formation of sulphate-of-lime crystals, and consequently no phosphate of lime could be present. If, on the contrary, I examined in the same way the blastema produced beneath the spurious exudation, after the lapse of about twenty-four hours, I not only met with beautiful exudation-cells and pus-globules, but also, by adding a drop of sulphuric acid, could observe a rapid formation of crystals, so as to be led to the conclusion that the phosphate of lime is present in a large quantity, where cells are produced, and that it is wanting where we find nothing but amorphous masses. Lastly, with respect to this point, I have to draw the attention to the muscular tissue itself; and it will become evident, from my observations, how small a quantity of phosphate of lime we are able to detect by the kind of examination alluded to. The muscular tissue is well known to contain a certain quantity of phosphate of lime; it was the result of Liebig's inquiries, that when the formation of muscular tissue from the constituents of the blood takes place, nearly the whole quantity of alkaline phosphates returns in the blood, and that at the same time a certain quantity of phosphate of lime becomes chemically fixed in the organs themselves. This quantity, then, however small it may

be in a muscular fibre, which is so fine, as, by microscopical examination, to show the transverse stripes, I have detected, in the above-described way, in a few muscular fibres which I had submitted to the action of sulphuric acid for about twenty-four hours. I observed, after this time, by the microscope, crystals of sulphate of lime—of course only in very small quantity, but beautifully formed. Especially in this kind of preparation the different stages of crystal-formation are to be well observed.

After these experiences, the other question remained—whether the phosphate of lime really influences and increases the produce of cells? I have tried to solve this question in a double way, first by experiments, and on the other hand, by practical inquiry.

With respect to the experiments, it is my firm belief that I succeeded in artificially producing cells, which did not show any distinction from pus-globules and what we call exudation-cells. For this purpose I mixed together a part of the albumen of a hen-egg, some pure fat, a small quantity of phosphate of lime, and a very few drops of water; put the mixture, which was contained in an evaporating-dish, into a hot sandbath, at a temperature of 104° F., and then microscopically examined the changes which took place in the mixture itself. After the lapse of from four to six hours, I observed that an accumulation of albumen and phosphate had already taken place around the fat-globules; and after another period, equally long, I found those forms of cells which I have figured in the first plate of the paper alluded to. In another preparation I distinctly observed the gradual process of the formation itself by the simultaneous appearance of all the stages of formation of cells. Considering as the first stage the pure fat-globules, I observed, as the second, fat-globules, which presented a turbid appearance, in consequence of an accumulation of albumen and of phosphate of lime on their outside; and this accumulation, increasing more and more, produced cells, which did not differ in their appearance from real exudation-cells. By the addition of sulphuric acid to these cells, I obtained the same results as by treating exudation-cells or pus-globules with it; there appeared on the outside of the cells very small and dark forms of crystals, which I considered to be crystals of sulphate of lime. I further observed some larger cells, which included a smaller one, so as to exhibit the appearance of what is called the "ovum primitivum," the observations and communications of which are communicated by Rud. Wagner in his splendid work, 'Prodromus Historiæ Generationis.' It appeared to me, that in these cases an accumulation of fat took place on a ready-formed cell, and that this fat-accumulation became surrounded again by the combined albumen and phosphate of lime. By the addition of acetic acid the cells became clearer, and dark molecules appeared on their surface.

Now with respect to the natural combination of the albumen of a hen-egg with a small quantity of phosphate of lime, I inquired whether the formation of cells should not take place by the mere addition of fat to it, and its continued exposure to a temperature of 104° F. I have instituted experiments with respect to this point; and I have found, that after the lapse of about eight hours some forms of cells should be detected, but their quantity was much smaller than in the above-described experiments—a result which was to have been expected, if the theoretical views upon which I founded my observations were correct. In conclusion, I have to state, that I obtained the same results by repeatedly performing the same experiments, and I only hope that they may soon be repeated by physiologists who are known to be authorities in this kind of observation.

With regard to the above-mentioned practical inquiries I equally obtained satisfactory results, which evidently showed that the phosphate of lime increases the formation of cells, supposing a sufficient quantity of albumen and fat to be present. I must refer to my former publications with respect to the individual cases; here I only beg to mention the general results.

First I tried the phosphate of lime in patients who suffered from chronic ulcers, resulting from the scrofulous diathesis, and exhibiting a want of formation of cells in the highest degree. These patients had been for a long time under medical treatment, inclusive of my own, but all remedies had been fruitless, such as cod-liver oil, ointments of lead and zinc, lotions of nitrate of silver, &c. Being myself quite sure, that no influence of the former kind of treatment could be still remain-

ing in operation, and even after having left off all treatment for a long time, I then ordered the phosphate of lime to about four or eight, to twenty grains per diem, and after a few days the ulcers evidently showed themselves in another state. The suppuration improved; instead of an ichorous secretion, a pus bonum et laudabile was produced, and after a few days longer the cicatrization began. In children, in particular, I obtained very striking results, and there was not the least doubt, that the effect must be ascribed to the phosphate of lime. Generally I ordered it to be taken with the breakfast, dinner, and supper, in order to have it mixed as well as possible with the food taken; it is certain, that the phosphate of lime easily dissolves in albuminous solutions as well as in mineral acids, and in the acid of the stomach. But I have especially to mention, that in several cases, some time after leaving off the use of the phosphate of lime, I observed a fresh outbreak of the ulcers, for the real cause of which circumstance I could scarcely account at the time; I only supposed that the bad living of the patients, the food exclusively consisting of potatoes and bread, the abode in a damp unhealthy air, &c., caused the continuance of the general dyscrasia, and the repeated breaking out of the local affection. I am able now to account for it better than I could before, and with respect to this point, I must refer to the following parts of these communications.

As most of these ulcers occurred in patients afflicted with scrofula, the question arose, whether the phosphate of lime really cured the scrofulous dyscrasia, or only part of it. With regard to this point, from many observations, the number of which has much increased since, it resulted that there exists an undoubted intimate relation between scrofula and want of phosphate of lime, but that we are not able to cure the dyscrasia by the mere use of the phosphate. The same is the case with tuberculosis, a disease which is well known to be intimately related to, if not identical with, scrofula. In both kinds of disease, however, we shall promote the cure in the most efficient manner by the administration of the phosphate of lime, and I cannot forbear recommending its use as much as possible. In the following pages I shall give the explanation of these facts, which I hope will at once prove, that the effect of the phosphate ought to be such an one as I imagined and really found it to be. I have especially to mention, that the waste of tissues, or, in other words, the want of formation of cells, was apparently less in many cases of tuberculosis and scrofula, which were treated with phosphate of lime, besides other remedies, than in those which were treated without the phosphate; that the cure of tuberculous ulcers of the intestines was evidently promoted and even effected by the administration of the phosphate, and this remedy proved most efficient in cases of incipient acute tuberculosis, and even those which are well known to manifest at their commencement nearly all the symptoms of typhus. I need not enter here more deeply upon the special effects of the administration of the phosphate in these cases, if the one general fact is always kept in mind, that it increases the formation of cells, or prevents the rapid and fearful waste of tissues.

In accordance with those facts, the phosphate of lime proved most beneficial in children who suffered from scrofula, diarrhœa, ulcerations and excoriations of the skin and the bowels, general waste of the cellular tissue, loss of power, &c. In these cases, the mere use of six to ten grains per diem was often quite sufficient to effect the cure, and I have met with such striking and satisfactory results, as to leave no doubt that the want of the phosphate of lime was the real cause of the symptoms alluded to. These results, too, are confirmed by many physiological observations. Chossat, for instance, observed that pigeons, in consequence of an artificial want of phosphate of lime in their food, became afflicted with diarrhœa and softening of the bones; children, in the period of dentition, or when afflicted with rickets, which disease positively shows a want of phosphate of lime, are especially well known to suffer from diarrhœa, sores, &c. Still I have to mention the interesting observation, that in patients who were afflicted with diseases in which the phosphate of lime proved beneficial, and who consequently were supposed to suffer from a want of phosphate of lime in their economy, wounds of occasionally applied blisters healed much more slowly than was the case in other patients, and the more so the more distinctly those symptoms appeared which should be referred to a want of phosphate of lime.

In syphilis I had also tried the phosphate of lime, and even in persons who had for a long time already suffered from secondary ulcers, ulcers of the bones, &c., and became emaciated and extremely weak during that time. These cases likewise showed a most beneficial effect of the phosphate on the formation of cells. It ought to be mentioned, that besides the phosphates, the iodide of mercury was administered, but I have never met with such a rapid cicatrization of syphilitic ulcers, as was the case in these persons, and I could not help thinking that the cure was promoted in a remarkable degree by the internal exhibition of the phosphate. With respect to this point, I have drawn attention to the relation between scrofula and syphilis, and I think there are many symptoms in both of these diseases, and many facts besides, which evidently show an intimate relationship between them, and require a more accurate study than has been given to them hitherto.

As to other affections, in which I have tried the phosphate of lime, I have to mention rickets, caries, inflammations, and consecutive abundant suppurations of the cellular tissue, and also fractures of the bones. In all these cases, the administration proved most beneficial, and I would strongly advocate its further experimental use. With respect to fractures of the bones, I have to state in particular, that the consolidation of the callus took place in a much shorter period than is generally the case; however, too large doses of phosphate of lime must be shunned in these cases, as I have observed an abundant callus, causing a deformity of the bones, produced by the daily administration of twenty-four grains of the phosphate for a fortnight.

With regard to the fact that phosphoric acid is always produced in the economy by the changes of albuminous substances, and supposing that this phosphoric acid might combine with the lime, if carbonate of lime has been given, I tried also the carbonate; but the results of its administration were not so favourable as those which followed the administration of the phosphate, unless in some cases where the urine presented a high degree of acidity. This even was the case in many children afflicted with scrofula, and it must be decided by future experiments, whether the carbonate of lime is preferable to the phosphate in these patients.

[Having stated the principal facts, affording a proof of the relation of the phosphate of lime to the formation of cells, Dr. Beneke proceeds to add, that as the formation of cells is increased by the administration of the phosphate of lime, we may ask—in the diseases shown to be most beneficially influenced by the administration of phosphate of lime—is the phosphate present in the system in a smaller quantity than it ought to be in the normal state? But it is impossible to determine directly the phosphate of lime which is present in the body. One might suppose the question might be solved by making accurate analysis of the blood, but]

We cannot avail ourselves of the analysis of the blood in order to solve the above question; but there is another way which will enable us to do so, and this way is afforded by continued analyses of the urine and the fæces. Thereby we shall know what quantity of phosphates is thrown out of the system, and by comparing this quantity with the average quantity of phosphates taken with the food, we shall be very well enabled to judge of a general increase or decrease of the earthy phosphates in the system. However, as it is very likely that the greatest part of the phosphates contained in the excretions of the bowels originate directly from the ingesta, and as it is certain, on the contrary, that the greatest part of the earthy phosphates contained in the urine originate from the wear and tear of the tissues and bones of the system, I have in the first place only directed my attention to the latter, and I have found the analysis of the urine to give a satisfactory answer to the question proposed. It is clear that if in the normal state from six to eight grains of phosphate of lime are eliminated from the economy in twenty-four hours, an elimination of from thirty to forty grains must indicate a general loss of bony substance; and from the quantities of phosphate of lime found in the urine, we may approximately determine whether such a loss takes place or not. I do not myself consider the analysis of the urine alone sufficient for a complete solution of the above question; such a solution absolutely requires also analyses of the fæces and ingesta; however, it will be seen that, to begin with, those analyses of the urine are sufficient, and that they indicate the way which we have to apply to in our future inquiries. Thus, then, instead of the above question, the

question that arises is, whether in those diseases which I have shown to be most beneficially influenced by the administration of phosphate of lime, the earthy phosphates are eliminated from the system by the urine in a larger quantity than in the normal state? whether different quantities of phosphates are excreted in different diseases generally? and what quantities these are?

I am happy to state that I have succeeded in answering this question satisfactorily; and it really afforded me great pleasure to see the results of the analyses of the urine agreeing in the most remarkable manner with my former observations. I have found that in all chronic diseases which are distinguished by wasting, emaciation, ulcerations of the skin and of the bowels, &c., (such as scrofula, especially rickets, &c.,) a much larger quantity of phosphates is removed from the economy by the urine, than ought to be in the normal state; and even such quantities as one would never have imagined, without entering into these examinations.

Previously, however, I have to say a few words on the mode of examining the urine which I adopted. As in other examinations of this kind, I here also only endeavoured to obtain approximate results, which I believe to be sufficient for general deductions. It seems to me quite indifferent, indeed, whether we know that a man's urine which is passed during twenty-four hours, contains ten grains or whether it contains eleven grains of phosphates; if our mode of analysis is sufficient to show whether a given quantity of urine contains, ten, fifteen, twenty, thirty, fifty, or more grains of phosphates, I think this mode affords a way by which we may arrive at positive results. First, I believe it ought to be our only object to obtain such general and positive facts, upon which we can base our physiological and pathological views; and having become acquainted with these positive general facts, we may enter upon their more accurate examination, though in many cases we shall hardly gain anything else thereby, than a quantity of numbers, more positive and accurate than could be obtained in the other way: we shall gain other numbers but no other views. In this way I then proceeded with respect to the phosphates of the urine; and the following was the mode of examination which I employed.

It is well known that the phosphates of lime, as well as of magnesia, are held in solution in the urine by its acidity, and directly precipitate when the urine becomes alkalescent by the addition of alkalies, or ammoniacal by putrescence. This precipitation of the phosphates becomes much more complete when the urine is heated or boiled, and by the addition of a solution of soda to boiling urine we may precipitate the whole quantity of phosphates present. Supposing now we put a small quantity of urine (about two drachms) into a test-tube, boil it, and add a few drops of a solution of pure carbonate of soda, so as to make the urine alkalescent, and directly we shall perceive whether a small or a large quantity of phosphates is present. By always making use of the same solution of soda (I used a solution of one ounce of dry carbonate of soda in twelve ounces of distilled water), and of the same sort of test-tubes, we shall further observe, that by the precipitation of the phosphates, certain and distinct degrees of turbidity are produced in this way in different sorts of urine, and even these degrees are so well marked, and so easily distinguished one from another, that I have considered this way sufficient in order to judge of the quantity of phosphates present in any urine. I therefore marked these various degrees of turbidity by numbers, and so exhibited for myself seven various types, on which I founded my observations. By No. 0, I marked a sort of urine which did not show the least turbidity by the addition of soda when boiled; by No. ½ a sort which became opalescent by the same means; by No. 1, a sort of urine which became opalescent in a higher degree, but so as still to admit of the recognition of objects behind the test-tube, as, for instance, the bars of the window, &c.; by No. 1½ a sort which exhibited an opalescence of such a degree that it was impossible to see through it, or to recognise any object behind it; by No. 2, a sort which became quite turbid by the addition of soda, when boiled; by No. 2½, a sort from which, after a few seconds, proceeded a precipitation of phosphates, when treated in the same way; by No. 3, a sort which directly yielded a precipitation by the addition of soda; and lastly, by No. 4, a sort of urine from which the greatest possible amount of phosphates was precipitated. These numbers, and these significations of them, soon became so familiar to me, that by several most accurate analyses, which I instituted in order

to have a test of accuracy, I almost always obtained equal results, so as to convince me that this mode of analysis was to be relied upon.

Of course there occurred descriptions of urine which could not with propriety be marked by any of the numbers alluded to; well, then, I marked them by ½, 1½, 1½, &c.

In order to know the positive quantity of phosphates which was contained in the different sorts of urine, I made most accurate analyses of each of them, and these analyses the more increased my confidence, as they showed quite similar results to the numbers proposed.

When meeting with alkaline or ammoniacal urine, of course, after having well stirred it up, so that the sediment, if there be any, should be equally distributed throughout the whole, I first tried the degree of alkalescence, and according to this degree I added a few drops of soda-solution or none; and when meeting with albuminous urine, I first precipitated the albumen or boiled the urine, after the addition of the solution of soda, in which case the albumen does not coagulate. The eye may often prove fallacious; however, I could never deviate far from the truth, and the error committed could never surmount the quantity of phosphates which I marked by ½, or at the most, ½.

In accurately determining the quantity of phosphates present in any of the numbered types, I used the following method:—Four ounces of urine are made ammoniacal by the addition of a few drops of ammonia; the precipitation thereby produced is redissolved by acetic acid, and then a sufficient quantity of a solution of oxalate of potash is added; a precipitation of oxalate of lime takes place, and this having subsided, after about twenty-four hours the urine is filtered. Thereby a residue of oxalate of lime and a filtered fluid is obtained. The oxalate of lime is then burned with the filter, and carbonate of lime results. Now, on gently removing the lid of the crucible, a few drops (3 to 5) of concentrated sulphuric acid are added; the acid is evaporated at about 200°, and then the sulphate of lime is strongly burned. The resulting weight of sulphate of lime multiplied by 0·7647 gives the same accurate amount of phosphate of lime, the weight of the filter-ash having been previously deducted. To the filtered urine is then added a few drops of ammonia, and a precipitate results which consists of phosphate of ammonia and magnesia (triple phosphate). After a few hours this precipitation is collected on a filter, and the residue, burnt with the filter and weighed, indicates the exact quantity of pyrophosphate of magnesia, the weight of the filter-ash having been here also previously subtracted. By summing up the quantity of phosphate of lime and of phosphate of magnesia, we shall obtain the exact quantity of earthy phosphates which is contained in four ounces of urine, from which may be easily calculated the quantity contained in one ounce, or in 1000 parts of urine. (This method of analysis has been investigated by Dr. Heintz, at Berlin, and kindly communicated to me by Dr. Boecker.)

The following now are the results of the analyses which I have performed in this way, and which we may depend upon the more as most of them have been twice repeated. First, the urine which I marked by 0, always contains a very small quantity of phosphates; this quantity, however, cannot be detected in the above-described way, but it never seems to exceed the quantity of 0·2000 grains in one ounce of urine. There are many steps between no phosphates at all and of 0·2000 grains; they require a more accurate study in order to show the preternatural decrease of the quantity of earthy phosphates in the urine. But as we shall consider here only the hypernormal increase in the quantity of phosphates which are excreted in the urine in diseases, I am compelled to waive this discussion at present. I have only to state that in every case we may consider a urine marked by 0, as containing 0·2000 grains of earthy phosphates, or less; never more than this in one ounce. With respect to the other descriptions of urine, I should really far exceed the limits of this paper by adducing the results of the single analyses; they can be seen in a pamphlet which I have lately published in Germany, entitled, 'Zur Physiologie und Pathologie des Phosphorsauren und Oxalsauren Kalkes,' Goettingen, 1850. Here I only beg to state the general results as follows:—

A urine marked by ½, contained nearly 0·250—0·300 grains of earthy phosphates in one ounce; a urine marked by 1, 0·400—0·450 grains; a urine marked by

1½, 0·550—0,600 grains; a urine marked by 2, 0·700—0·750 grains; a urine marked by 3, 1·000—1·050 grains; and lastly, a urine marked by 3—4, 1·000—1·3000 and more grains of earthy phosphates. By referring to these numbers we may easily approximately calculate the quantity of earthy phosphates voided in twenty-four hours, and I am sure we shall never be far from the truth.

After these explanations I have to speak of the different quantities of phosphates which I met with in the urine in different diseases. My observations of course do not extend to all diseases; it would scarcely be possible to give such accounts in a large number of years, notwithstanding I observed a sufficient number of cases with respect to this point for the deduction of some general results.

First, I have to remark generally, that scarcely any disease occurs, in the course of which we should not sometimes find an increased quantity of phosphates; that at any rate there exists no disease which does not admit of some hypernormal excretion of phosphates at some one of its periods; on the other hand, we meet at different periods of disease with quite different quantities of phosphates, as, for instance, it often happens that in the first stages of disease we do not find an increased quantity of phosphates at all, and that at a later period a large quantity is excreted. With respect to this point, and in order to obtain results which can be depended upon, it is therefore indispensably necessary to examine the amount of phosphates almost every day; we shall never arrive at correct views if we do not attend to this rule.

Secondly, it must be stated as a general result, that the quantity of phosphates excreted does not depend as well upon the nature of the disease itself, as upon the individual afflicted; and if in one case of rheumatism we find, for instance, a large amount of phosphates in the urine, we do not detect any increase at all, perhaps, in another case. This point really is a very important one; it affords the best proof of the general fact, that we are always wrong in speaking of certain diseases as of individuals, or as of well defined and marked never-varying alterations of the physiological state of the body, and that we shall never succeed in obtaining positive results, if we do not direct the most accurate attention to the previous history and the former state of the individual who has become afflicted with any disease—in other words, if we do not individualize disease.

It may be concluded from these short remarks, that it is very difficult to give an account of the excretion of phosphates, generally applicable and absolutely right in almost every case. However, we meet with some pathological states which, generally speaking, very rarely show an increase of the excretion of phosphates: with other affections which always show an increased quantity of phosphates in the urine and even a most anomalous quantity; and with others which are generally distinguished by a slighter, but continued loss of phosphates. To these states and affections I shall now draw attention, and I scarcely know how to give a better explanation of them, than by referring to the numbers above alluded to.

I have met then with urine containing only such a quantity of phosphates as I have marked by 0 or ½—

1st. In persons who, always showing a good state of health, a normal complexion and colour, and a strong constitution, have accidentally become afflicted with disease or injury, as, for instance, with syphilis, wounds, contusions, &c. As I really considered these persons as nearly healthy, at least for so long a time as the affection remained a local one, I am inclined to view the quantity of 0·1000—0·2000 grains of earthy phosphates in one ounce of urine as nearly the normal quantity. It must, however, be remembered, that it is always extremely difficult to speak of normal states of health, a precise distinction between health and disease being incompatible with our present amount of knowledge, if conceivable at all.

2nd. In the first stages of acute diseases, as, for instance, of acute rheumatism, pneumonia, pleuritis, peritonitis, &c. When these diseases happened in persons who did not exhibit any other signs of diseased constitution, and had never been ill before, I did not, either during the whole course of the disease or upon recovery, find an increased quantity of phosphates in the urine. But it was seldom I met with such persons. When, on the other hand, persons were afflicted with acute diseases who never enjoyed good health before, or suffered from dyscrasia of the blood, I almost always met with an abnormal quantity of phosphates in the

urine after the acute stage having ceased; there appeared now all the symptoms of the original dyscrasia, and either the reconvalescence was a very slow one, or emaciation, general weakness, &c., was still increasing; instead of acute tuberculosis, the symptoms of chronic affection of the lungs appeared; instead of acute rheumatism, chronic rheumatism remained. From these very remarkable differences I concluded with certainty, that it was not the disease itself which caused a decrease of the excretion of phosphates, but that this decrease was exclusively dependent upon the acuteness of symptoms, that is to say, the feverish action—a circumstance which I shall refer to in the following parts of this paper. It must also be mentioned, that in some cases of acute disease I met with a quantity of phosphates as marked by ½ or 1, even during the first periods; in these cases, however, the quantity of phosphates was very considerable after the acute symptoms having ceased.

3rd. In the first stage of typhus fever. Here I always met with a decrease of the quantity of earthy phosphates in the urine, a result which, after a great many analyses, seems to be a characteristic one. With respect to the later periods of typhus, however, the same refers to them as I have stated on acute diseases generally.

4th. In some cases of Bright's disease, as well as in some persons who suffered from stenosis of the orifices of the heart, or from insufficiency of their valvules. But some cases also occurred where an absolute increase of phosphates was met with; however, in these cases complications or affections of other organs could be observed; and I am inclined to suppose that the dyscrasia of the blood, which leads to the well known degeneration of the kidneys, as well as the dyscrasia which results from the above-mentioned diseases of the heart, does not cause by itself any increase of the earthy phosphates in the urine.

5th. In the first stages of carcinoma (but only in these); an observation the more interesting, that Rokitanski alludes to the preternatural developement of the bones, or the proportion of phosphate of lime in persons afflicted with cancer. I myself, found in a post-mortem examination of an individual who died from carcinoma of the lungs, all the cartilages of the ribs ossified; which was never the case in persons who during life passed for a long time increased quantities of phosphates, and had been afflicted, for instance, with tuberculosis.

I have to add generally, that in all cases where I observed no increase of the phosphates in the urine during *the whole course* of a disease, I likewise never observed emaciation; that is, want of formation of cells: these persons altogether were of strong constitution, and showed a remarkable developement of the muscles. In these persons blistered surfaces healed far more speedily than was the case in persons who passed a hypernormal quantity of phosphates, the average time being three or four days. Of course in acute diseases emaciation was observed, though no abnormal loss of phosphates could be detected; the same was the case with Bright's disease. In these affections, however, many circumstances concur, which sufficiently account for the waste of tissues—circumstances which do not require any further explanation.

With respect to the quantities of phosphates which I marked by ½, 1, 1½, and even 2, I found them to be present in very different and nearly all sorts of diseases, varying on different days in one case, and always remaining of nearly the same amount in others. These cases proved in a most remarkable manner that it is not the disease itself which causes the excretion of phosphates, but that there must necessarily exist some other cause in the economy, to account for the excretion alluded to. I observed the mentioned quantity of phosphates, that is to say, from about 0·350 to 0·700 grains in one ounce of urine, in chronic rheumatism of the joints or muscles, in the chronic stage of tuberculosis, in the ulcerative stage of carcinoma, in different sorts of chronic diseases of the skin, such as eczema, impetigo, ecthyma, and boils, slight cases of scrofula, syphilis, emphysema of the lungs, and especially in cases of chronic dyspepsia, hemorrhoids, &c. It is impossible to give any special account of the quantities observed, unless I give a special explanation of every case, an explanation which would too far exceed the extent of these papers; moreover, I shall speak about the cause of the excretion of phosphates in the following part of this communication, and we shall become acquainted thereby with those circumstances on which the excretion of the different

quantities in different diseases depends; but I have to state that the general complexion of patients in these cases rarely surpassed what we call the middle degree, and often even did not surpass an emaciated, feeble state of health; these patients do not get fat or muscular, in spite of large quantities of wholesome food; on the contrary, the more they take, the less they gain strength and power; indeed, as long as the excretion of phosphates is abnormally increased, the formation of cells is impaired.

Thirdly, I have to speak of diseases in which I met with the largest quantities of phosphates, such as marked 2, 2½, 3, and 4. These quantities have been found:—

1st. In scrofula and rickets. Especially in children afflicted with scrofula and ulcers, or other diseases of the skin, as impetigo, boils, &c., with diarrhœa and atrophy, I found large quantities of phosphates passed by the urine; in one case of inflammation in the knee-joint, in a young man who was afflicted with scrofula, the quantity of earthy phosphates passed amounted to nearly a drachm every day.

2nd. In tuberculosis, especially in those stages where the very acute state and deposition of tubercles in any organ has ceased, a slight fever, however, and the dyscrasia of the blood continues. I did not observe any increased quantity of phosphates during the first attacks of acute tuberculosis, exhibiting the well known symptoms of typhus; but as soon as the localization had taken place, and an exudation in the lungs was produced, the general symptoms decreasing in acuteness, the phosphates appeared in the urine in an increased proportion, and soon amounted to 0·8, 0·9, or even one grain in one ounce of urine. This being the case, I was rather puzzled at not finding any increase of phosphates during the very last days of some persons dying of tuberculosis. But also this point I shall account for in the following part of this paper.

3rd. In such cases of acute rheumatism which occur in anemic individuals, and are well known to be accompanied by a remarkable loss of flesh, or by a want of formation of cells. I have mentioned already, that in the acute stages of these cases, I met with no increased proportion of phosphates at all; but as soon as the acute stage was over, the phosphates appeared, and then rapidly increased to nearly the same amount as I observed it in tuberculosis.

4th. In the last stages of carcinomatous and some other affections, yielding large quantities of pus or ichorous secretions, such as psoas abscess, suppuration of the cellular tissue, &c. In these very cases, the general emaciation of the patients was very remarkable, although readily accounted for, if we take into consideration, that for the formation of cells three substances are required—namely, albumen, fat, and phosphate of lime, and that two of these were evidently excreted from the economy in an immense quantity; on the one hand, by the suppuration; by the urine on the other. However, I also met with some rare cases in which a remarkable emaciation took place, in consequence of abundant suppurations, without a remarkable increase of the phosphates having been observed. But these cases could scarcely afford any objection to my other results, the suppuration being so large as sufficiently to account for the emaciation itself. It is self-evident, that in all cases where emaciation takes place, we must not only look at the quantity of phosphates eliminated from the economy, but likewise at the quantity of albuminous and fatty substances which have been taken as food during the course of the affection, which are present at its commencement, and which are eliminated in the form of pus, serous exudations, urea, &c.

With respect to the other cases referred to, it must also be generally stated, that in almost every case the emaciation was a very rapid one during the excretion of large quantities of phosphates, and sores of blisters applied to these individuals scarcely healed at all, or at least not till after a long time. We may provide persons who are afflicted with these diseases with the largest quantities of albumen and fat, but we never shall produce thereby a remarkable increase of tissues or complexion—that is to say, of formation of cells, if we do not diminish at once the excretion of the phosphates by the urine. The disease will not cease as long as their excretion continues, but if a decrease of the phosphates in the urine takes place in an early stage of the affection, we may be induced thereby to believe that the condition is really an improving one. On the other hand, it should be remarked that the nature of the diseases alluded to is a very different one; that, therefore, the hypernormal excretion of phosphates is also here independent of

the disease itself, and that there must exist some other cause of it, the investigation of which will be the subject of the following part of this paper.

These are the chief points which I have to refer to, with respect to the different quantities of phosphates excreted from the economy in different diseases. The general conclusions are, that a hypernormal excretion of earthy phosphates by the urine is independent of the nature of the disease; that wherever we observe such an excretion, we find a corresponding deficiency of formation of cells, emaciation, and loss of strength; but that, finally, this deficiency of formation of cells is not always exclusively caused by a hypernormal loss of phosphates; that, on the contrary, it is often only the result of fever, of suppuration, of want of nourishment, or of any other loss of materials necessary for the regeneration of tissues and organs.

There is one point more, which I have to direct attention to. It having been well known for a long time, and more accurately established by the inquiries of Dr. Bence Jones, that the quality and quantity of the urine are very different at different times of the day, I also examined the quantities of phosphates voided at different periods in the twenty-four hours. It is not here the place to explain, that by repeating the very interesting examinations of the urine, published by Dr. Bence Jones in the 'Philosophical Transactions,' Part II., 1849, p. 235, I did not obtain quite the same results as this able physician, respecting the decrease and increase of the acidity of the urine; I only have to remark with respect to the phosphates, that this quantity also is very varying at different periods of the twenty-four hours. But from a great many analyses of this kind, I could not detect any certain regularity in the excretion of the phosphates; it may only be stated that generally in persons who are known to pass hypernormal quantities of earthy phosphates during twenty-four hours, in one sort of urine, out of three or four sorts passed after dinner, we find the largest quantities of phosphates; and that likewise generally one specimen of urine, out of three passed in the morning, contains a large quantity of them; the other ones showing either a decrease from, or an increase to, the highest amounts, or no hypernormal excretion at all. This being a fact, we shall never be able to judge of the quantity of earthy phosphates present in one ounce of urine of any person, unless we examine the whole quantity which is passed during the twenty-four hours. A quantity of urine, passed at a certain time of the day and examined with reference to the phosphates, will always lead to wrong conclusions respecting the whole quantity of phosphates excreted during twenty-four hours. I have carefully attended to this circumstance in my observations, so as to make them trustworthy in this respect; it should never be neglected by others entering upon similar investigations.

To sum up now the results of the first and second part of these communications, I have shown in the first that, supposing a sufficient quantity of albumen and fat to be present, the produce of cells evidently increases by the administration of phosphate of lime; that, on the other hand, by this administration we may promote the cure of diseases which show a deficiency of formation of cells; and that especially in scrofulous affections the administration of phosphate of lime has often proved most beneficial. On the other hand, in the second part, I have established the fact, that in nearly all chronic diseases, where we observe a loss of flesh, emaciation, and general weakness, a hypernormal quantity of phosphates is always excreted from the economy by the urine, and more especially in those cases where the administration of phosphate of lime proved most beneficial. Perhaps it might be supposed that these quantities had been increased by the phosphate of lime taken as a remedy; but this is by no means the case; on the contrary, my observations prove, that even during the administration of phosphate of lime, the quantity of earthy phosphates in the urine often decreases, supposing a proper treatment in other respects to be employed. Well, then, the harmony of the results of the above two parts is so striking, that we can scarcely admit of any doubt in their truth, and the physiological as well as pathological importance of the points alluded to is so apparent, that it does not require any further explanation. We know that the phosphate of lime is indispensably necessary for the production of cells; we know that in a great many diseases the phosphates are excreted from the economy in very abundant quantities by the urine; and we know even that in these diseases the formation of cells is deficient. Shall we have any

doubt that by substituting the quantity of phosphates excreted by the urine, or by removing the cause of their excretion itself, we must afford a great benefit to persons who are afflicted with the diseases alluded to.

There remains one difficult point, which I have to refer to. In the way which I relied upon in determining the quantities of phosphates in the urine, I precipitated the phosphate of magnesia, as well as the phosphate of lime. This having been shown microscopically and chemically, the question arose, whether the results which I spoke of with respect to the phosphate of lime would not require an amendment? It is true the proportions between the phosphate of lime and phosphate of magnesia are very different in different urines; however, I rarely observed the quantity of magnesia to exceed the quantity of lime; on the contrary, it was oftener found less. I therefore concede, without any hesitation, that the exact quantity of phosphate of lime could not be ascertained in the manner which I have adopted; but generally we shall not be far from the truth in supposing half the quantity of earthy phosphates present to consist of phosphate of lime, this being generally below and very rarely beyond the real quantity. I must repeat with respect to this point the above given remark, that I have only looked for approximative results, and that I believe them sufficient for the conclusions which I have drawn. All these relations demand a very accurate revision; nor can I refrain observing that the proportions between phosphate of lime and phosphate of magnesia in different diseased persons are highly interesting, so much so as to recommend their most accurate study and exact analysis. In expressing this opinion, I refer, for instance, to a communication in the 'Annales de Chimie et de Physique, Juin, 1849, tom. xxvi.,' 3e série, entitled, 'Recherches sur les Causes du Goître et du Cretinisme, par M. T. Grange,' but I am compelled to waive the discussion for the present, it being rich enough in itself to form the subject of a special treatise.—*Lancet, April* 19, *June* 21, *and June* 28, 1851, *pp.* 434, 668, 699.

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## 153.—ON THE BLOOD, IN ITS RELATION TO THE EXCRETIONS.

By Dr. H. Bence Jones, F. R. S., &c.

One of the most interesting substances, and certainly the most important one, is carbonic acid, which passes out by respiration. By a very easy and beautiful experiment I can show you its presence in the blood. I have here an apparatus which will produce hydrogen. I have a tube full of caustic potash, which will stop any trace of carbonic acid which can possibly exist. Sulphuric acid is made to act upon zinc so as to produce hydrogen; this hydrogen passes through the solution of caustic potash; it then passes into another vessel, into which, when filled with the hydrogen, some healthy blood is put; the hydrogen bubbling through this, passes through some lime-water in other vessels; and if it carries with it any carbonic acid, the lime-water will of course become turbid. You see how rapidly this turbidity is produced. Carbonic acid, then, is a substance which exists in the blood, and is passing out each moment by respiration. The proportion of carbonic acid to oxygen, in arterial blood, is as 16 of the former to 6 of the latter; and, in venous blood, 16 carbonic acid to 4 oxygen. This proportion was determined for us by the German chemist, Magnus. He found that the quantity of nitrogen was the same in both kinds of blood. M. Majendie states, that in venous blood, in every hundred volumes, there are seventy-eight volumes of carbonic acid gas, and in arterial blood 66 per cent.

Other substances can be obtained from the blood which are constantly passing out of the body in the urine. The most interesting of these are uric acid and urea, substances which form the peculiar characteristic constituents of the urine. These can be found in small quantities in healthy blood. I have here a beautiful specimen in long crystals of urea obtained from the healthy blood of an ox, for which I am indebted to M. Verdeil. It is obtained by drying the serum of the blood, reducing it to the finest powder, mixing it with alcohol, and then pouring off the alcoholic solution, which, in health, always contains small quantities of urea. In some diseases the quantity of urea in the blood is considerable—as for instance in Bright's disease. In this disease the blood-globules are exceedingly

diminished—the albumen is constantly passing out in the urine; and it is always found that urea is one of the constituents of the serum. It may be obtained thus:—Here is the serum of a patient who was bled in St. George's Hospital. Here is a portion evaporated to dryness; a part of this dry residue is treated with absolute alcohol, the alcoholic solution is evaporated in vacuo to dryness; and the dry residue is dissolved in a little water; on the addition of nitric acid, nitrate of urea, as you see, immediately crystallises.

Uric acid is also found in the blood in health and in disease, combined with soda. It was discovered by Dr. Garrod, of University College; he states that it exists in increased quantity in the blood of gouty subjects; and, from my own experiments, I can confirm the truth of his statement. Dr. Garrod also says, that he found in Bright's disease urate of soda in excess in the blood. In that disease the kidney is prevented from performing its proper functions; the ingredients of the urine are not separated as they should be, and thus urea and uric acid accumulate in the blood. Uric acid, like urea, can be easily detected, by taking the serum, or the blood as a whole, evaporating it to dryness, reducing it to the finest powder, and treating it with boiling water; urate of soda will thus be obtained in solution. The liquid is filtered off from the insoluble albumen, and the clear fluid is mixed with strong acetic acid, and set aside to crystallise. The uric acid adheres to the sides and bottom of the glass. It may be collected, and will give the characteristic reactions with nitric acid and ammonia.

Kreatin, which I formerly mentioned as one of the constituents of the flesh, probably exists in the blood. It exists certainly in the urine, as I shall have to show you. Hippuric acid, also, which exists in the urine, especially in graminivorous animals, has been found in the blood. It was detected in the blood of an ox, by M. Verdeil. Lastly, Dr. Garrod also considers that he has found oxalic acid in the blood of a patient in University College Hospital.

Thus, then, there exist in the blood, not only the substances which pass into the body as food, but the substances which pass out in the excretions. I have said that the great peculiarity of the blood is, that it contains fibrin and the red globules; these substances cause the blood to differ from all other fluids. The spontaneous coagulation and the red colour are caused by the globules and the fibrin; neither of which exists ready formed in the food, nor are they ever found in the healthy excretions. If it were not for these substances, it might almost be said that the blood was nothing but a solution of food passing in, and of substances passing out of the body; it is then by the formation of the fibrin and blood-globules that the blood is made a peculiar substance,—an organized liquid, which may live and die like the more solid organs of which we are composed.—*Medical Times, August* 2, 1851, *p.* 115.

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## 154.—ON THE THERAPEUTIC USES OF INDIAN HEMP.

By Dr. Alexander Christison.

[Indian hemp, in spite of the strenuous recommendations of Dr. O'Shaughnessy, has been but little used in this country hitherto.]

Dr. O'Shaughnessy used it in the following diseases:—In three cases of rheumatism he found it apparently beneficial. In one of these, it seemed to produce great insensibility, and a state resembling catalepsy; but on this state passing off, the man was found to be thoroughly restored to health. In an epidemic of cholera, it was thought serviceable; but although it seemed to stimulate the circulation, and check diarrhœa, it is doubtful whether any ultimate good resulted. In a case of hydrophobia, a soothing effect, with diminution of the spasms, and greater facility in drinking, was kept up for four days; but the patient died. Several cases of tetanus were also treated by him in this way, with apparent success. In one, ascribed to cauterization of the hand by a quack mixture of incandescent charcoal and tobacco, a state of intoxication was excited by large doses of the extract of hemp, and the spasms were gradually put an end to; but death ensued in the end from mortification of the hand. Another patient consumed 134 grains of the extract, and was ultimately discharged from the hospital cured. A third case, with similar results, is detailed. At the Native Hospital at Calcutta, Mr. O'Brien treated seven cases of tetanus in this way, and in four of

them he employed ten-grain doses. The result was, almost immediate relaxation of the muscles, and interruption of the convulsive tendency. Four of these cases recovered. A case in the practice of Mr. Richard O'Shaughnessy is also detailed, where the disease was connected with suppurating wounds of the scrotum. The hemp had no effect for four days, and then the patient became tranquil, with fewer paroxysms, and the appetite good. When the hemp was intermitted, the symptoms became aggravated; latterly, the hemp caused much excitement, and was therefore discontinued. The last case is one of infantile convulsions, where very large doses were given, and where the narcotic action greatly relieved the symptoms. The child recovered. This gentleman is confident that the resin is capable of arresting the progress of tetanus, and that, in a large proportion of cases, it will cure the disease.

It would certainly appear from the above facts, that Indian hemp has proved of service in the treatment of tetanus, as it occurs in India. How far this result has been obtained in Europe, I shall now describe.

That I may not extend my observations to too great a length, I shall limit my remarks to the treatment of tetanus, as observed in cases in private practice, and in the Edinburgh Royal Infirmary.

Professor Miller has provided me with the following remarks:—

"My own experience speaks loudly in favour of the hemp. I can now record three fortunate cases under its use—all traumatic tetanus—and a case which proved fatal, but where great alleviation of suffering was produced.

"The first of these was a girl, aged seven, admitted to the Royal Infirmary, October 18, 1844. She had received an extensive injury of the middle finger of the right hand a fortnight previously. Inflammatory swelling and pain became intense, and there was a tendency to spasmodic flexion of the fingers and wrist. On the 23rd she was observed by the nurse to take a 'kind of fit,' becoming rigid, having difficulty in opening the mouth and in swallowing, and complaining of pain in the jaws. At visit, she seemed perfectly well. A brisk purge was ordered, and, lest the case should prove tetanus, ten drops of tincture of hemp were prescribed to be taken every four hours. Next day the symptoms were well marked without any influence from the hemp. The finger was then removed, and the simplest dressing applied to the wound. The dose of hemp was increased to 20 drops, and after five doses, she slept; but the following day the symptoms were aggravated. Turpentine enema was ordered, and ice to the spine—30 drops of cannabis to be given hourly. In the evening there was rigidity, but no spasm; the hemp to be given every half-hour; after which she became drowsy, and at 12 next day she was much improved. Aconite was now substituted; but as the spasmodic attacks became more severe, hemp was again given, with the effect of producing sleep. She continued to improve till the 25th November, the dose of hemp being gradually reduced; producing, when given, drowsiness, or calm sleep; it was soon discontinued, as it then seemed to excite the circulation. Throughout the whole period of its use, its effect on the appetite was most obvious, the craving for food being at times absolutely voracious. After this no more medicine was given, and recovery was complete.

"The second case, occurring in private practice, was that of a boy, about the same age, who had simple fracture of the thigh, with compound and comminuted fracture of the great toe. The treatment and result were the same.

"The third was a boy, rather older, who had compound fracture of the bones of the arm. Treatment again resulted in cure.

"In these cases a few doses generally induced sleep, with marked mitigation of the spasms. The period of narcotism did not exceed two or three hours; the sleep was deep and unbroken, and seemed to be refreshing. It was followed by no headache, or other apparent inconvenience. The most remarkable effect observed, was the tolerance of the remedy, whereby a girl, aged seven, took every half hour, and sometimes many hours in succession, doses of hemp sufficient to narcotise an adult."

In these cases, Mr. Miller is inclined to give the hemp credit for a chief share in the cure.

In 1846 the virtues of hemp were tested in a case of tetanus in the Royal Infirmary, in the wards of Dr. Duncan. In 1847 another case presented itself, where hemp was administered. At that time sulphuric ether was much used as an anæs-

thetic, and it was thought probable that it would be of service in this case. The patient inhaled it at frequent intervals during a whole afternoon, with decided, but only temporary relief. After this cannabis was given, without its physiological action being attained by nearly an ounce and a half of the tincture; it was not persevered with. Ether was again tried, and also opiates with some benefit. The patient died on the 13th day.

The first of these cases was very accurately observed, and the following report of the case from the journal will be found to have considerable interest:—

James Mackay, a railway labourer, was admitted under the care of Dr. Duncan, October 20th, 1846. He had received a slight lacerated wound of the hand a week before, and tetanus had commenced on his admission. The wound appeared to be healing. He complained of great general uneasiness, particularly about the neck and spine, of some rigidity of the jaws, which could only be separated three-quarters of an inch, of inability to protrude the tongue, and of commencing spasm of the neck and upper part of the back. He complained also of "a burning about the heart." His expression was anxious, with but little "risus." His thirst was great, but swallowing difficult. He perspired profusely. The spasms, of short duration, recurred once or twice every minute; pulse, 115 to 120, soft. Opening medicine was ordered, and at eleven o'clock tincture of hemp was given, repeated in doses of fifteen or twenty drops, with appreciable effect. On the 21st the bowels were not opened, though a turpentine enema was administered. The spasms were more violent and general, and a touch caused general spasm. He had not slept; 120 to 140 drops had no effect. The doses were increased to sixty or eighty drops every three quarters of an hour, and croton-oil was given, producing free action on the bowels; and in the evening the spasms abated, but the hemp caused only slight dozing at intervals. The tincture was ordered to be continued, and strong beef-tea to be drunk.

On the 22nd swallowing was easier, the spasms less violent, but not less frequent; 100 drops were given at half past eleven, and continued about every half hour till four o'clock, when drowsiness was quite decided; he was not readily roused, even by the spasms which, though as frequent, were not so intense. At nine o'clock drowsiness was passing off; copious stools, coloured as by the medicine, were brought away by injection; 130 drops were given, and repeated at midnight, at which time he was much relieved, but suffered from cough. On the 23d the spasms were again gaining strength, no hemp having been given for nine hours. A drachm of the tincture was given, and repeated at eleven, when he became quiet. The doses were continued till evening, when he took mince-collops and beef-tea without difficulty, and the bowels were copiously relieved.

On the 24th, at visit, the spasms were absent, but the chest symptoms were worse, with general mucous râle, and frothy sputa mixed with blood. Drowsiness had been kept up by doses of a drachm to a drachm and a half. In the evening he was much weaker, but quite sensible, with a desire for food. On the 25th he was perfectly free from spasm, but was evidently dying, from accumulation of mucus in the chest. Very little hemp was given. He died at eight p.m.

In this case six ounces of O'Shaughnessy's tincture of Indian hemp were given in all, being equal to 144 grains of the extract. The extract for the tincture was reputed the best in Edinburgh. The doses at first were evidently too small. The examination of the body was not permitted.

It is a safe conclusion, from these facts, that Indian hemp deserves further trial in the tetanus of Europe, as well as in that of hot climates. I would particularly urge, however, the necessity, in all such trials, of making certain, by experiment on healthy persons, that the preparation to be used is good. For the present there is no other satisfactory test of quality.

As to the use of hemp as a calmative and hypnotic in diseases in general, I may mention that, while acting as clinical clerk in the Royal Infirmary, in 1849, I had several opportunities of administering hemp in different diseases as a hypnotic. The object was in general attained, and no evil results followed. I regret there is no record of these cases, as at that time I did not pay particular attention to the subject. Hemp is frequently given in other wards of the infirmary for a like purpose. In cases of phthisis and other lingering diseases, where opiates have for a long time been administered, but have ceased to produce sleep, Indian hemp may often be

given with advantage; thus, in one case of advanced phthisis, doses of five or ten drops of the tincture were successful in procuring sleep when other means had failed.

Dr. Christison has administered hemp in many instances. He gives the following account of two of them:—

A gentleman had suffered from palpitation of the heart for twenty-one years, and at night the attacks were generally most severe. He had used one medicine after another with the hope of relief, but he did not derive any benefit. Dr. Christison advised him to try Indian hemp. The patient's wife states that he passed the night on taking it without suffering from the palpitation, though still he was perfectly conscious of its presence; and that the attack left him entirely at 8 a.m., instead of continuing twenty-four hours, as it previously did.

In the other case, a gentleman was afflicted with a severe eczema over the whole body, with intense itching. A large dose of solution of the muriate of morphia caused extreme sleepiness, but so much increased the itching that he was kept awake by the necessity of scratching. Twenty-five drops of cannabis tincture gave him six hours' sleep, and he continued to enjoy sleep from four to six hours every night for six weeks, without increasing the dose, until the eruption was nearly removed: during all this time the itchiness continued as before when he was awake.

Dr. Christison has observed that, in the generality of cases, hemp has had the effect of causing sleep without disturbing the function of the stomach or bowels. Given where morphia and hyoscyamus had failed, it has also repeatedly failed to cause sleep; but in one or two cases he has found it to succeed where morphia and opium disagreed.

An interesting series of cases by Mr. Donovan will be found in the 'Dublin Journal of Medical and Chemical Science' for 1845. This gentleman was convinced of the beneficial effects of hemp, particularly in cases of neuralgia. Mr. Donovan had himself suffered occasionally since early life from neuralgic pain of different parts of the foot, lasting one or two days, or sometimes a week. Immersion in cold water gave entire relief, but no other treatment did so, till he took five drachms of weak tincture of hemp; in twenty minutes the pain was gone; at the same time, "he had hardly any consciousness of the motion of his limbs when walking—they appeared not to belong to him." On another occasion, he took six drachms without effect; but on the third night, after taking twelve grains of weak extract, he was free from pain, and slept four hours; and in several other attacks he derived similar benefit.

A gentleman was attacked on going to bed with excruciating pain in the left upper jaw, which kept him awake till morning; after a short sleep, he awoke in torture, and in the evening, upon taking his third dose of fifteen minims of weak tincture of hemp, he slept profoundly till eight next morning, when the pain was much abated. At night he repeated the remedy, with similar results, and next evening he took twenty minims, which deadened the pain; but it soon became as bad as ever. Embrocations of laudanum and camphor spirit were then tried, with another dose of twenty minims, and he immediately fell asleep; in the morning the pain was nearly gone, and it soon disappeared.

Another gentleman had excruciating sciatica for thirteen weeks; his sufferings caused groans, cries, and tears, and he passed sleepless nights. The only relief he obtained was from firm pressure on the hips, and, for a short time, from laudanum. Two doses of hemp, at short intervals, produced sound sleep for eight hours, and on awaking he was perfectly relieved. Five doses more so completely subdued the pain that it gave little farther trouble. He experienced a slight but transitory return on entering a cold room.

A number of other cases will be found in Mr. Donovan's paper, in which the hemp, if it did not effect a cure, yet was of great service in the treatment of the complaints to which he alludes; but in several cases no good followed, and, on the contrary, unpleasant effects were produced. Thus, a lady suffering from neuralgia of various parts of the body was ordered five drops of strong tincture at night; next morning she was giddy and weak, and, without authority, took five drops more. She became faint and universally cold, had some apprehension of death, and remained disagreeably affected during the whole day; the pain was not relieved, and the effects of the hemp reappeared at intervals for two or three days.

Another patient, who was accustomed to take hemp, on one occasion had alarming depressing symptoms; he sat, greatly agitated, with his eyes open, and his head reclining on his chest. The respiration was tremulous, with interruptions of sobbing; his whole frame was in an indescribable shudder, and he seemed to shiver with cold. The pulse was good all the time, and in half an hour he recovered.

Indian hemp, in different forms, has been recommended, principally by the older writers, for several other purposes, as in the treatment of diarrhœa, gonorrhœa, and locally as an anodyne lotion, or in the form of poultice for hemorrhoids. For these purposes, I am not aware that it is now used; but there is one affection where it has lately been applied with advantage—viz., uterine hemorrhage. Dr. Churchill says ("Diseases peculiar to Women," Ed., 1849)—We possess two remedies for these excessive discharges, at the time of the menses going off, which were not known to Fothergill—ergot of rye, and tincture of Indian hemp. The former has been long known to possess the power of restraining uterine hemorrhage after delivery, &c., but the property of hemp of restraining uterine hemorrhage has only been known to the profession a year or two. It was accidentally discovered by my friend, Dr. Maguire, of Castleknock, and since then it has been extensively tried by different medical men in Dublin, and by myself with considerable success. The tincture of the resin is the most efficacious preparation, and it may be given in doses of from five to fifteen or twenty drops three times a day, in water. Its effects, in many cases, are very marked, often instantaneous, but generally complete after three or four doses. In some few cases of ulceration, in which I have tried it on account of the hemorrhage, it seemed to be equally beneficial.

These effects seem to me to be allied to the action of hemp on uterine contraction during labour, to the consideration of which subject I shall next proceed.

[The following interesting cases are given by Dr. Christison of the powers of Indian hemp on the contractions of the uterus.]

One woman, in her first confinement, had forty minims of the tincture of cannabis one hour before the birth of the child. The os uteri was then the size of a shilling, the parts very tender, with indurations around the os uteri. The pains quickly became very strong, so much so as to burst the membranes, and project the liquor amnii to some distance, and soon the head was born. The uterus subsequently contracted well.

Another, in her first confinement, had one drachm of the tincture, when the os uteri was rigid, and of the size of a half-crown; from this the labour became very rapid.

Another, in her first confinement, had also one drachm of the tincture, when the os uteri was of the size of a half-crown. Labour advanced very rapidly, and the child was born in an hour and a half. There were severe after pains.

A fourth had ℥iij. of the tincture, in divided doses, which much accelerated and increased the pains. She had then chloroform for six hours. I have since been informed, that the severity of the pains was so great as to cause some alarm, and chloroform became necessary to produce insensibility.

*Case* 1.—Was a natural labour and eighth pregnancy. The first stage was not completed till twenty-four hours after the woman was seized. Hemp was given four hours before its completion. After the first dose of eight drops, little effect was observed; but after the second of twelve drops, the duration of the pains was increased, and the interval shortened; and it was very obvious that the intensity of the pains, counting from the second pain after the hemp was given, was increased; by the fourth or fifth pain the effect wore off, and hemp was not again given.

*Case* 2.—This was a second pregnancy. Seventeen drops of hemp were given in the second stage. The second pain, after the hemp was taken, was lengthened, and the interval shortened; this was not the case with the third pain; but the intensity of the pains was much increased and the woman was speedily delivered.

*Case* 3.—First pregnancy. Hemp was given in the second stage of labour, and the chief fact observed was increased intensity of the pains; the duration of the pains was slightly increased, and the intervals decidedly shortened, after the second dose of hemp. Twenty drops were first given, and after twenty minutes thirty drops more. Twenty-four hours after, twelve drops were given, and after-pains

were induced, which the woman said were "quite as bad as when she took in labour first."

*Case* 4.—First pregnancy. Twenty-five drops of the tincture were given at the completion of the first stage; after this, both the pains and the intervals were shortened, and the intensity of the pains increased. After one or two pains the effect wore off, and thirty drops more were given at the end of half an hour. The third pain after this became very intense; and pain succeeded pain without intermission for several hours. As there was deformity of the pelvis, chloroform was administered, and delivery accomplished by the forceps.

*Case* 5.—First pregnancy. Hemp was given during the second stage, first thirty drops, and then thirty-five drops after half an hour, and the patient was delivered during its action. The effect of the first dose was chiefly shortening the interval at first, and prolongation of the pain; but the effect on the interval was more marked after the second dose. The pains were described by the patient as more intense, and by examination it was ascertained that the head of the fœtus was more forcibly propelled.

*Case* 6. First pregnancy. Thirty drops of hemp were given in the second stage, and the effect was very decided. Previous to the administration of the hemp there had been no progress for an hour, the patient was nervous and excited, and though she complained much of the pains, the contractions of the uterus were felt to be feeble, and the child's head did not move; but on the second pain after the cannabis the contractions became very strong, forcing down the head, and the child was expelled ten minutes after the hemp was given. At the same time there was no decided effect on the duration of the pains and intervals.

*Case* 7.—Sixth pregnancy, with the first stage not completed. Thirty-two drops were given, and the action was well marked; the woman said, the second pain after it was the strongest she ever had. After an hour and a half, forty drops were given, but the action was not attended to; and in an hour and a quarter fifty drops were given, but there was no action on the pains; they became irregular, and the intervals were very long; the case was then allowed to proceed naturally. There seemed to be a tolerance of the remedy; for though 120 drops had been taken, no physiological effect of any kind was induced.

In these cases, then, it does not appear that the duration of the pains or of the intervals was materially affected in all; but in cases 1, 2, 4, prolongation of the pain and shortening of the interval were most obvious; while in case 5, a shortening of the interval corresponding to each dose of hemp was observed. Shortening of the interval was in general a more conspicuous phenomenon than prolongation of the pain. Upon the whole, however, I am not inclined to lay much weight upon these results. But there can be no doubt that the *intensity* of the pains was greatly augmented by the hemp, except in the last case, where, after the effects of the first dose passed off, no action followed the repetition of it. This case was an exception to all the others.

It is worthy of remark, that in none of these cases were the ordinary physiological effects produced; there was no excitement or intoxicating action, and there did not seem to be the least tendency to sleep in any of them.

In conclusion I may state what appears to be the most obvious difference between the action of ergot of rye, and that of Indian hemp. First,—While the effect of ergot does not come on for some considerable time, that of hemp, if it is to appear, is observed within two or three minutes. Secondly,—The action of ergot is of a lasting character, that of hemp is confined to a few pains shortly after its administration. Thirdly,—The action of hemp is more energetic, and perhaps more certainly induced, than that of ergot.

There appears little doubt, then, that Indian hemp may often prove of essential service in promoting utering contraction in tedious labours.

More extended experience will show how far these effects may be depended on, and to what cases hemp is most applicable.

*Mode of Administration.*—Indian hemp may be administered in several ways. The extract, in the form of pill, produces the most gradual effect, and the disagreeable taste of the solution is avoided; but its action in this form is very uncertain. The following emulsion has been recommended:—A scruple of the extract rubbed in a warm mortar with a drachm of olive oil, to which are added half an

ounce of mucilage, and seven ounces and a half of distilled water (Bromfield). But the simplest method is to use the tincture, which should be dropped into a little water, and immediately swallowed. The water may be sweetened with sugar; or an aromatic, as compound tincture of cardamom, may be added. The usual strength of the tincture is three grains of the extract to a drachm of rectified spirit.

The extract may be given in doses of one to six grains; the tincture in doses of ten to thirty drops, for ordinary purposes. Less than thirty drops is of little service in promoting uterine contractions; and greatly larger doses, as much as one or two drachms repeatedly, must be used in the treatment of tetanus, in which disease there is very great tolerance of the remedy.—*Monthly Journal of Med. Science, July and Aug.* 1851, *pp.* 39, 117.

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## 155.—EPITHELIAL CANCER OF PHARYNX AND TRACHEA—IMPENDING SUFFOCATION—TRACHEOTOMY—LIFE PROLONGED FOUR MONTHS—POST-MORTEM APPEARANCES.

Under the care of Dr. Barlow, Guy's Hospital.

[This case occurred in a female, Frances P., æt. 31, an unmarried woman, who had been living in service as cook. Had always enjoyed good health, and been very temperate. Had had some difficulty in swallowing for many years. About two months before admission, she had caught cold, when the symptoms became much worse, there being present increased dysphagia, some dyspnœa, pain about the throat, and failure of voice. These symptoms were not relieved, and on admission she had great difficulty in swallowing, and could localise the pain to a spot behind the larynx; the dyspnœa was especially great at night, the air giving a sharp sound at deep inspirations. In spite of all remedies she grew rapidly worse, and the emaciation was so great that cod-liver oil clysters were given, but from irritable and partly inflamed piles, these could not be borne. The dyspnœa now became so distressing and suffocation so apparently imminent, that the operation of tracheotomy was performed. Mr. Poland describing it says:]

The operation was easily executed on account of her emaciated state; a small longtitudinal incision was carried down to the trachea, with scarcely any bleeding, and then the trocar and canula pushed between the rings into the trachea; the trocar was removed, and the canula fixed by tapes. A gush of air rushed out, the breathing soon became tranquil, and in the course of a few hours the patient sank into a quiet slumber.

From this time the patient improved greatly; the breathing became quite natural and easy through the tube, and the swallowing also was not so difficult, fluids and soaked bread passing readily down the œsophagus. A local application of caustic solution was brushed over the back of the throat and larynx to arrest, if possible, the disease.

About the early part of October she began to gain flesh, and was able to get up for about an hour or so. She had occasional attacks of constipation and diarrhœa, which were immediately obviated. During the months of October and November she made very little progress either way; she could swallow fluids pretty well, and breathe comfortably, but occasionally complained of pain about the sides of the larynx, and more so when it was moved about laterally; there was also some sensible enlargement at that part, and some hard nodules could be felt. The inner tube up to this time required to be taken out and cleaned only twice a day, but now, owing to the increased secretion of mucus, it was necessary to remove it three times.

In December the patient became worse; the difficulty of swallowing increased slowly, and the breathing was not so free. The tube also began to be displaced and tilted forwards, evidently indicating the progress of the disease downwards, and pressure on the trachea below the end of the canula.

Towards the end of December and beginning of January, pneumonia of a low type set in; the cleansing tube required to be removed more frequently, and was always clogged up with firm, tenacious, rusty secretion. She could hardly swallow even fluids, which caused burning pains and spasmodic coughing, producing

asphyxia. Now and then some of the fluids given would find their way through the tube, consequently enemata of nutritious fluids were administered. She, however, slowly declined and emaciated rapidly; she had one or two attacks of asphyxia, gradually got weaker, and died exhausted on January 10th, 1850, four months after the operation, and six months after her admission.

The canula or outer tube was removed only four times after the operation, and was with difficulty introduced again without the aid of a blunt trocar for its more ready insertion.

*Post-mortem examination*, Jan. 11, 1850.—The body was extremely emaciated, and weighed only 50lbs.; the height was 5 feet 3 inches. The os hyoides somewhat displaced. The thyroid glands were enlarged, and converged inferiorly, so that their two extremities were in close approximation. The inner edge of the left one had been just grazed by the knife. There was an irregular opening in the trachea through the second and third rings, almost hidden by the thyroid gland, requiring the separation of their lobes in order to expose it fully. All traces of the cricoid cartilage were gone, a mere thin cartilaginous membrane being left. Some enlarged and hardened glands occupied the space between the trachea and œsophagus on the right side.

On laying open the pharynx and œsophagus from behind, it was found that the whole of these structures were involved in that form of malignant disease denominated "Epithelial Cancer," partly ulcerated, and extending from opposite the hyoid bone to near the bifurcation of the bronchi. The disease had involved the whole of the posterior part of the larynx and trachea, as far as the sixth tracheal ring. There was great pressure and consequent flattening of the larynx, so that the anterior and posterior walls were in contact. Opposite to, and just above and below the seat of tracheotomy, there was an extensive, ulcerated opening, forming a communication between the trachea and œsophagus. (*See* Preparation in Museum, 1793[10].) No cancer could be found in any other part of the body. There was recent lobular pneumonia of both lungs, and in part suppurating.

*Remarks.*—This case affords a very interesting and typical example of a certain class of malignant growths, termed "Epithelial Cancer." The skin and mucous membranes are their seat; and the disease generally attacks those parts most liable to abrasion of the cuticular surface, thus the several narrow parts of the mucous canal, as the œsophagus, behind the larynx, the pylorus, and the rectum. The disease runs a peculiar and almost constant course; it commences as a tubercular elevation, which spreads slowly along the mucous tract, interfering with the functions of the part, and sooner or later taking on an ulcerative action. The disease progresses by extension, and often remarkably slowly, as in the above case; but frequently it will assume a more rapid course, if any local irritation be set up: it generally kills by its local influence, and not by constitutional contamination. In the inspection of all the cases of this class that I have had an opportunity of seeing, there has been found no trace whatever of malignant disease in any other part of the body, thus at once characterising the disease as one of purely local cancer.

With regard to the diagnosis of this case, it was pretty evident that the obstruction was seated opposite the thyroid cartilage, that it involved both the pharynx and larynx, and that the obstruction was not owing to external causes, for none could be felt, but that it was a disease in the tubes themselves. The only other question to be raised, is the propriety of the operation of tracheotomy; this, however, is answered at once by the result, the patient living four months, and the greater part of that time in comparative ease and comfort.—*Guy's Hospital Reports*, Vol. vii., 1851, *p.* 317.

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### 356.—EPITHELIAL CANCER OF THE FEMALE GENITALS—OPERATION—RECOVERY.

[Ann B——, aged 48, admitted March 5, 1851. Had had six children and seven miscarriages, five of them occurring after the last child. No history of syphilis. Menstruation had ceased a year. Ten years before a numbness had been felt in the external genitals, and afterwards upon the upper and inner surface of the left labium, a small, hard swelling, of the size of a pea, was noticed,

which slowly spread, softened, and became an ulcerated surface. Latterly it had become so painful as almost entirely to prevent sleep.]

Dr. Oldham writes—"There is a deep excavated ulcer, of the size of a crown piece, with a rough, hardened, and uneven base, which has destroyed the clitoris, and has extended to the upper part of both external labia, leaving the lower part quite free. The upper margin of this malignant sore has a hard elevated edge. The nymphæ are not implicated, but this structure bounds the lower edge of the ulcer. The vagina and uterus are free from disease; and on the most careful examination, there is no evidence of malignant disease either in the neighbouring lymphatic glands or elsewhere." Ordered:—

℞. Potass. iodid., gr. iv; liq. potassæ, ℥x, ex inf. cascaril., ter die; lot. liq. calcis c. opio; morph. acetat. gr. ¼; o. n.

Dr. Oldham thought that the parts might be removed; and Mr. Poland, after consultation with Mr. Hilton, proceeded to the operation.

March 18th. The patient was placed on the operating table, in the position for lithotomy, and under the influence of chloroform. The whole of the mass was grasped with the left hand, and the entire disease removed with one sweep of the knife. Not much hemorrhage ensued, and only five arteries required tying. Pressure with a T bandage applied. On the following day the urine had to be drawn off; but considerable difficulty was experienced in finding the orifice of the urethra, as its upper margin had been just shaved by the knife, and the urethra had retracted and was hidden by the wound. The woman progressed favourably, she had not a bad symptom, and the wound healed up by granulation very rapidly. She was presented in April, and was looking much improved in appearance.

[Another case of this kind occurred in Rachael L——, aged 46. Had been married twenty-five years; had had two still-born children and two miscarriages; had always been of a nervous temperament, and subject to all sorts of dyspeptic symptoms. Her grandmother and mother had died of bleeding cancer of the womb; her father died of tumours in this hospital; and her brother, aged 60, had a large tumour under his arm.]

Twelve months before she had contracted gonorrhœa from her husband. About six months since she perceived a lump in the left labium, which was attended with scarcely any pain; this soon increased, but was afterwards followed by ulceration; extending at first rapidly, and discharging a large quantity of serum; but again becoming quiescent. About a month before she had experienced severe lancinating pains in the part, and the disease began again to progress, and to discharge a dirty, sanious, bloody fluid. It had been slowly spreading up to the present period. There was a large excavated ulcer, of the size of a crown piece, involving the clitoris, urethra, a portion of the vagina, and the upper part of the nymphæ; the edges hard, slightly everted; the surface irregular, ulcerating, and discharging a thin sanious fluid. Dr. Oldham could detect no disease of the vagina and uterus, and there was no evidence of implication of the surrounding tissues. Excision of the whole disease was determined upon; and on the 29th of April, under the influence of chloroform, the entire mass was removed by the knife. Not much hemorrhage, and no vessels required tying. Pressure, and the T bandage was then applied. No untoward symptom occurred; she passed her water freely on the following day, although the anterior quarter of an inch of the urethra had been removed. The wound soon began to granulate, and during the early part of June she was presented perfectly well.

*Remarks.*—Here we have again two excellent specimens of epithelial cancer; the one of ten years' standing, the other of only twelve months' duration, showing the irregularity of the disease. Its peculiarities are strikingly depicted in each case, both as regards its local nature and its progression by extension. It is an exactly similar disease to that of chimney-sweeper's cancer; the one being an epithelial disease of the skin, the other of the mucous membrane. Both, if unchecked, progress by extension and destroy life, either by exhaustion, in the shape of a large, ulcerating, serous-discharging sore, or by extension along the lumbar glands. They are purely local diseases, but unfortunately liable to a return. Having examined several cases of death by cancer scroti, I can fully and confidently assert that no other organ or tissue was affected with cancer, excepting

they were implicated in the disease itself.—*Guy's Hospital Reports*, Vol. vii., 1851, p. 326.

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## 157.—NEW GALVANIC APPARATUS.—DR. PULVERMACHER'S HYDRO-ELECTRIC CHAIN.

[The following ingenious and novel mode of applying galvanism as a remedial agent to the human body has been brought forward by M. Pulvermacher. The apparatus was placed in the Great Exhibition.]

The apparatus is in the form of a chain battery, which may be worn continuously on or around the affected part; and it differs from the other forms we have already noticed in affording a weak and almost painless current, which occasions little or no inconvenience to the wearer. The construction of the chain battery is thus described by the inventor. "In order to produce a large surface within a small space and with little material, positive and negative wires (*of zinc and brass*) are coiled round a small lengthened piece of wood in such a manner that they run parallel to each other at very small distances, but without immediate contact. At each extremity of the wooden core, the end of one of the wires is bent into a gilt eye (the other end being fixed into the wood) so that at one extremity of the wood, the eye from the positive wire, at the other extremity that from the negative wire, project beyond the core; the whole forming the metallic part of a galvanic element, with space between the wires for the fluids. A number of such elements linked together on the principle of the voltaic pile, therefore, constitutes the metallic part and arrangement of a battery, permanently connected, flexible in all directions, of considerable surface (quantity) in proportion to its size, and of an intensity, only limited by the number of elements employed. These batteries, although so small and light, are capable of producing powerful effects, as we have ourselves experienced, and we have no doubt that all the statements made by the inventor in his prospectus are correct. Thus a powerful shock can be obtained by a battery of 120 elements charged with distilled vinegar; and when the two halves of the battery are connected by an interrupting cylinder, consisting of a spring fixed in a small glass tube, so that every motion of the instrument breaks and renews connexion, producing a vibratory current, the effect is almost insupportable, and approaches in character to the more powerful electro-magnetic machine. The inventor states that a battery of eighteen of the elements decomposes acidulated water, while one of 150 produces visible sparks with the interrupting clock-work. Another curious effect is produced by these batteries, when the clock-work apparatus just mentioned is added to the apparatus, that of exciting rather powerful muscular contractions, unaccompanied by any considerable amount of pain. We have personally tried the apparatus, and can vouch for the accuracy of the statement that, while muscular contractions were excited, little pain or other inconvenience was produced. The exciting fluid may be either water, together with the perspiration, the mildest form in which it can be applied, which produces a "constant mild irritation, felt as a slight itching, and the production of small pimples; or vinegar, when charged with which, the battery produces a burning sensation at and near the poles. When the interrupted current is required, as in paralysed limbs, the small glass tube or interrupting cylinder may be inserted in any part of the chain, by which slight but sensible shocks are produced by every movement of the body.—*Med. Times, August* 2, 1851, *p.* 130.

[Dr. Pulvermacher's modification of Volta's pile has attracted so much attention that the following account of its value, by Dr. Golding Bird, cannot but be interesting.]

Everybody is aware that the apparatus contrived by Volta consisted of plates of metals, differing in their respective affinities for oxygen, alternated with pieces of cloth dipped in a saline solution. Thus, in the most common modification of this pile, a plate of copper is placed on the table, on this a plate of zinc, and then a piece of flannel or cloth, dipped in a solution of common salt; on this a second plate of copper, and so on. The theory of the apparatus is so well known, that it is unnecessary to say more than that, under the chemical action of the saline fluid on the zinc, the combined electric fluids existing normally in both the two metals

employed, are separated,—the positive electricity being found on the zinc, and the negative on the copper surface. Wollaston's and Cruikshank's are but modifications of the same contrivance,—cells filled with the saline fluid replacing the moistened cloth or flannel. The cumbrous nature of those contrivances, the time required to excite them, the rapidity with which the intensity of the electric current diminishes, as well as the tact and management required to apply the current they evolve, have always presented most serious obstacles to their adoption into medical practice. On this account they have been almost completely replaced by the different machines for furnishing a current of induced electricity. These, it is true, possess many advantages, and become most important appliances in the treatment of disease, as has been repeatedly pointed out by myself and others. Still we have often felt the want of an apparatus by which a uniform and uninterrupted current of voltaic electricity could be at our command at a short notice, and without involving the necessity of any manipulative tact in its application. The hydro-electric chain completely fulfils these desiderata.

The apparatus I have used, was placed in my hands during last winter, by Dr. Pulvermacher himself. He is a scientific man, and well acquainted with physical science generally, nor is he, I presume, responsible for the manner in which his invention has been extolled, as a sort of universal panacea, by the London agent in the public advertisements. Each element of this battery consists of a small piece of wood, around which are wound two wires, nearly but not quite in contact, one of these wires consisting of zinc, the other of gilded copper. These represent the plates in Volta's pile; each terminates in a ring, by which it is connected with the wires of the next link or member of the chain, the zinc of one being united with the copper of the next, and so on. When one of these links is immersed in a fluid capable of exciting a chemical action on the zinc, enough is retained by capillary attraction between the folds of wire to disturb the electric equilibrium of the metals, and to throw the negative and positive fluids into a state of current. The exciting fluid recommended by Dr. Pulvermacher is common vinegar, and if one of his chains be immersed in that fluid for a minute, and then lifted out, so that all not retained by capillarity may drain off, it will be at once fit for use.

The electricity excited by this apparatus is necessarily small in quantity, as the amount of electricity evolved must be in a ratio with the intensity of the chemical action exerted on the more oxidizable metal; yet its tension is tolerably high. It is indeed sufficient, both in quantity and tension, for the development of physiological phenomena. The following experiments will illustrate these properties, a chain of fifty alternations being employed:—

*a.* A thin piece of platinum wire being attached to the terminal links, they were immersed in water acidulated with sulphuric acid, and very distinct evolutions of exceedingly minute bubbles of oxygen and hydrogen were evolved from the two wires. The dilute acid being replaced by a solution of iodide of potassium mixed with starch, iodine was almost immediately set free at the wire where the positive current entered the fluid. The quantity of these electrolytes decomposed was exceedingly small, as the electrolytic power of the evolved current would of course bear relation to the amount of effective chemical action going on in the links of the chain.

*b.* The platinum wires were then connected with an astatic galvanometer; the wires were immediately deviated under the influence of the current, but the latter was not sufficient to retain the needles at right angles to their normal position. The astatic galvanometer was then replaced by an ordinary one, having a coil of thirty folds of wire, and carrying a magnetic needle, five inches long. The current was barely able to produce a permanent deviation from the magnetic meridian of five degrees. This feeble action on the magnetic needle is explained by the small *quantity* of electricity circulating through the chain.

*c.* The chain being held in a vertical position by one end, the terminal link was allowed to touch for an instant the lower plate of a condenser, six inches in diameter, in connexion with a gold-leaf electrometer. On lifting off the upper plate the gold leaves separated to the extent of a couple of inches. When only half of the chain was brought in contact with the electrometer, considerable divergence

also occurred. This experiment well illustrates the comparative high tension of the evolved electricity.

*d.* The first and last link of the chain being placed in cups of water, and a finger of each hand being immersed respectively into the two cups, a smart shock was experienced in each finger. This shock was repeated every time one finger was *raised out* of the fluid and redipped. But no shock was felt all the time the finger *remained* immersed, as the electricity passed in a continuous stream through the body from one end of the chain to the other; the physiological phenomenon of "shock" being produced only at the moment the current first entered the body. This is of course the same with all voltaic apparatus which yield an uninterrupted current.

These experiments are sufficient to demonstrate the electrogenic power of Pulvermacher's apparatus, and to point out that the current evolved is small in quantity, but of moderately high tension.

When a continuance of sensible shocks is required, an ingenious apparatus, contrived by the inventor of the chain, may be used. This consists of a small helix of thin wire fixed in a glass tube; one end of this wire passes through a cork in the tube, and ends in a hook; the other end is free, and is barely in contact with a metallic plate (also furnished with a hook), which closes the other opening of the tube. On connecting a chain of fifty elements to each of the hooks of this apparatus, the first and last link being grasped in the hands, a rapid succession of rather violent shocks will pass through the arms. These occur in consequence of the slight motion communicated to the chain by the hands, being sufficient to make the helix vibrate, and thus rapidly approach and recede from the plate at one end of the tube.

It must not be supposed, however, that sensible shocks are required to develope physiological phenomena or therapeutical effects. We are chiefly indebted to the laborious researches of Dr. Marshall Hall for teaching us the vast amount of therapeutical influence developed by a continuous current of voltaic electricity. I cannot, indeed, too strongly impress upon those who have to treat a case of old paralysis (unconnected with spasm) the vast importance of allowing a current of voltaic electricity to traverse the palsied limbs persistently for half an hour or more daily for weeks and months, nor to be disappointed at not witnessing any *immediate* good results. Nutrition of the limb is certainly thus increased, its waste and emaciation prevented, at least to some extent, and the probabilities of cure are much increased. Pulvermacher's chain, when once excited by immersion in vinegar, soon begins to evolve a current of decreasing intensity; but so long as even a small quantity of fluid remains unevaporated between the folds of the wire, evidence of the circulation of electricity can be made out by the electrometer. A moment's re-immersion in vinegar will at once restore the energy of the current.

The advantages of this apparatus to the medical man consist in its giving him a means of obtaining a current of electricity, of amply sufficient tension and quantity for all physiological purposes, at a moment's notice. He can, moreover, diminish or increase the tension by making use of a greater or smaller number of links. He can make the current continuous or interrupted, painful or painless, at will,—and he has moreover an apparatus so easily managed as to require no especial tact for its application. On the other hand, it must be recollected that the current evolved has no *peculiar* properties, and that it will effect nothing more than that evolved by any other means. It is, indeed, deeply to be regretted that so convenient a source of electricity runs the risk of losing favour in the sight of educated men generally, and of our profession in particular, by being injudiciously puffed in the public prints, by advertisements claiming for it a medical influence it in no wise possesses.—*Lancet, October* 25, 1851, *p.* 388.

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158.—*On the Influence of Variation of Electric Tension as a Cause of Disease.* By W. Craig, Esq., Ayr.—[Mr. Craig thus recapitulates the heads of the arguments he has advanced in a very interesting paper upon this subject.] .

1st. That heat and electricity are identical, as the one can be converted into the other.

2nd. That a large volume of electricity surrounds every primary constituent of matter, especially that form of matter which constitutes the gaseous bodies.

3rd. That animal heat is supported by the electricity liberated from the primary constituents of matter during the processes of respiration, digestion, and assimilation.

4th. That electricity is evolved during these processes on the same principle as that which is evolved during the action of a galvanic arrangement.

5th. That electricity and nervous power are analogous, if not identical; as the action of the one can be successfully substituted for the other.*

6th. That the majority of diseases are caused either by the sudden abstraction or slow abduction of electricity from the body.

7th. That a low state of electric tension on the surface of the earth, produced either by the operation of evaporation or some occult movement in the great internal currents of the earth, is the remote cause of epidemic and pestilential diseases.

8th. That occasional and ordinary diseases are produced by the sudden abstraction or slow abduction of electricity from the body, or its undue elimination during the vital processes.

9th. That since electricity is so essential to the integrity of the vital operations, it is indispensable that measures be taken to promote its evolution and prevent over-radiation.

10th. That electricity is the source of vitality in vegetable life.

11th. That electricity is attracted by the fibres of the roots of the plants; and by the instrumentality of the electric fluid does the plant extract its constituents from the soil.

12th. That vegetables of rapid growth require a large supply of electricity to secure their perfection and completion; and the potatoe is a plant of this kind.

13th. That the disease in the potatoe was produced by want of nutrition.

14th. That the want of nutrition arose from defective electric agency.

15th. That the cause of the deficiency of this agency was those abstracting influences which produced low tension of electricity.—*Med. Gazette, October* 10, 1851, *p.* 625.

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## 159.—PROFESSOR FARADAY ON SCHONBEIN'S OZONE.

Professor Faraday commenced by stating, that considerable mystery was attached to the subject which he proposed to bring before the members on the present occasion—namely, *Ozone*. This name had been given by Schönbein, of Basle, to a substance or condition of matter which manifested itself under very peculiar and widely different circumstances. Schönbein regarded it as an independent body, and a constituent of the atmosphere; but in his (Professor Faraday's) opinion, it was nothing more than an allotropic condition of oxygen. It was never manifested except where oxygen was present, and where, at the same time, water, in a liquid or vaporous condition, was found. No substance had ever been separated from the atmosphere where ozone existed; but its presence was manifested, not merely by the strong smell peculiar to it, but by certain well-marked chemical properties which the atmosphere containing it, possessed.

When electricity is produced from a powerful machine, and allowed to be discharged by a point, there is a feeling of a current or aura as of vapour escaping, and at the same time a remarkable odour. If, during the passage of the electricity, a piece of paper, moistened with a solution of iodide of potassium and starch, be brought near, the discharge causes the production of blue iodine of farina. The blue colour thus produced is the result of the oxidation of the potassium by the *ozone*, and the setting free of the iodine. This is one of the best tests for the

* This conclusion is, in our judgment, not justified by facts. Nervous power cannot be transmitted by anything but *nerve*. Electricity may be transmitted by a variety of conductors, organic or inorganic, and of these, nerve is one of the worst. Animals which evolve electricity are provided with distinct organs for this purpose. By nervous power, milk, urine, and bile are secreted from blood. Electricity, in any form, cannot produce these or similar results. They resemble each other in traversing their respective conductors with equal rapidity; but this is not sufficient to establish their identity.—*Ed. Gaz.*

presence of ozone. It was formerly supposed that nitric acid was produced by the discharge of the spark, and that the decomposition of the iodine was occasioned by this acid as a result of the union of oxygen with nitrogen in the air; but this theory will not account for the smell and other properties of this extraordinary agent.

Schönbein produces ozone in very large quantities by introducing into capacious bottles, with glass stoppers, pieces of cut and cleanly scraped phosphorus, with a small quantity of water, so that the phosphorus may be partly in and partly out of the liquid. A vapour slowly rises in a current. After ten or twelve minutes the ozone is produced, and may be procured in a mixture with oxygen and nitrogen by removing the phosphorus at a water-bath, and thoroughly washing the interior with water, in which ozone is insoluble. This body is thus separated from the vapour of phosphorus and phosphorous acid. (The experiment was performed in three bottles, and several bottles of ozone previously prepared were now brought forward). On introducing paper, wetted with starch and iodide of potassium, into one of the bottles, there was an immediate indication of the presence of this principle, by the production of a dark blue iodide of starch. Another remarkable property possessed by ozone was seen in its bleaching powers. Some ounces of a solution of sulphate of indigo were gradually poured into a bottle containing ozone, and shaken, when the colour was as completely destroyed as if chlorine or chloride of lime had been present. A very small quantity of ozone would thus entirely discharge the colour of a very large quantity of sulphate of indigo.

It has been already stated to be so little soluble in water, that a bottle containing it may be repeatedly rinsed with water without losing its ozonic contents. If, however, the stopper be removed, and it is exposed to air, it soon passes off. Ozone appears to be entirely destroyed by heat; or, at any rate, its production by electricity ceases when sparks are received from a red-hot metallic point. This fact was ingeniously illustrated by insulating a small galvanic battery, capable of raising at pleasure a platina ball to full redness: the battery was made part of the machine, and the platina ball the terminal point from which the discharges of electricity were received. The machine was set to work, and it was clearly and distinctly proved by Professor Faraday that the discharges from the red-hot platina ball produced neither the aura, the smell, nor the decomposing effects on iodide of potassium and starch, which were immediately manifested when the ball was allowed to cool, and the electric fluid was then passed through it.

The oxidizing properties of ozone are indicated upon metals which in practice it is rather difficult to convert to oxides—namely, silver. A piece of polished silver had been placed in a bottle of ozone for several hours, and had acquired a distinctly brown tarnish, not from sulphur, but from a process of ozonation, or, in other words, oxidation. Polished lead similarly treated was also oxidized. Ozone had always a tendency to bring metals and metallic oxides to their highest degree of oxidation. In this respect it was the most powerful oxidizer that was known. A tube containing several rings of metallic arsenic had been placed for a short time in a bottle of ozone. The metal had entirely disappeared, and had become transformed into arsenic acid. Paper wetted with a solution of proto-sulphate of manganese was introduced into a bottle of freshly prepared ozone, and in the course of a short time black spots appeared over the surface, proving that the manganese had passed to a higher degree of oxidation.

Nitrogen and sulphur are easily oxidized by it. Schönbein succeeded in procuring a quantity of nitre (of which a crystallized specimen was shown) by the agency of ozone in contact with nitrogen (of air) and potash. Sulphur was also converted into sulphuric acid. Paper stained with sulphuret of lead was immediately bleached when exposed to an ozonic atmosphere. Some curious experiments of Schönbein's were now shown, in which portraits and inscriptions were seen in white letters on a dark ground, as a result of placing stencilled metallic plates on paper which had been stained brown by sulphuret of lead. The uncovered spaces had been exposed to light and air, or *insolated*. The result was that in these spots the sulphuret of lead had entirely disappeared, having been converted to colourless sulphate of lead by the oxidizing action of ozone.

The alleged bleaching properties of solar light on coloured articles are thus probably due to the agency of ozone,—in other words, to a process of oxidation and alteration of the colour.

Sulphuretted hydrogen, phosphuretted hydrogen, and all foul effluvia, are speedily oxidized and destroyed by ozone. It is, therefore, the great purifier of the air; and, owing to its continual exhaustion by oxidating processes, it is difficult to discover the presence of ozone in large and populous places, or in close and crowded dwellings. In the open air of the country, and on the sea, it constantly exists in a proportion which is probably subject to great variation, although ruled by laws which are at present unknown. Schönbein had contrived an *Ozonometer* for testing the amount contained in air. It is prepared by immersing paper in a solution made of one grain of iodide of potassium, ten grains of starch, and two hundred grains of water. The paper is dried, and, when intended for use, is exposed for some time to the air. There is no change until it is wetted with water, when, if ozone was present in air to which it had been exposed, a blue colour will appear, the intensity of which varies according to the quantity of ozone present and the length of exposure. The ozonometer consists of a series of papers thus coloured in different degrees, and bears some analogy to the cyanometer long since proposed by Humboldt.

Professor Faraday stated that, during the last autumn, when at Brighton, while walking close to the sea-shore, he exposed some strips of this prepared paper to the current of air coming over the sea, and, on subsequently wetting the paper, the presence of ozone was distinctly manifested by the blue colour produced. On another occasion he received on the same paper the current of air blowing over the town, but no trace of ozone could be detected in it. When he went, however, on the windward side of Brighton, so as to catch the air blowing over the downs before it reached the town, ozone was strongly manifested by the result. It was thus established that in populous places there is a constant consumption of this principle.

It had been shown that ozone was evolved with the ordinary electricity of the machine: it was now proved that the current of the battery equally leads to its production. Water was decomposed by a Groves' battery, and the oxygen and hydrogen evolved were conducted through a tube in which cotton soaked in potash had been placed to arrest any traces of acid. The gases evolved at the end of the tube decomposed the iodide of potassium on starch paper, and gave the usual indication of the presence of ozone.

Ozone is evolved in numerous chemical processes. If pure ether, mixed with water, be introduced into a wide-mouthed capacious bottle, and the vapour allowed to become diffused, it will be found that litmus paper introduced is not reddened, and that starch paper prepared with iodide of potassium is not rendered blue. If, however, a glass rod be made hot in the flame of a spirit-lamp, and then introduced into the vapour of the bottle, litmus paper held above the rod becomes strongly reddened, and the iodide of potassium paper intensely blue. In the oxidation of ether vapour at a low temperature, ozone is evolved.

Ether, in its ordinary state, has no bleaching properties; but the ether thus treated had acquired the power of discharging the colour from a large quantity of sulphate of indigo.

Essential oils are thickened by long exposure to light and air; they become ozonized and their properties changed. This was illustrated by reference to oil of turpentine. Fresh rectified and pure oil of turpentine was proved, by admixture with sulphate of indigo, to have no bleaching power. A small quantity of oil, which had been exposed to air and light (the air in a bottle half full), destroyed the colour in a few minutes, like chlorine.

We cannot doubt that ozone exerts an important influence on the atmosphere, and, therefore, on the health of animals and vegetables. Schönbein, who is rather sanguine in his views, considers, from the irritant properties of ozone, that an undue proportion of it in air may give rise to epidemic influenza, bronchitis, and other affections of the air-passages; and in making experiments at Basle, he found that, concurrently with the prevalence of these disorders, ozone was very abundant in the air. On the other hand, it has been said that its deficiency in air will account for cholera or fevers, since the foul effluvia or miasmata giving rise to these diseases are not completely destroyed or removed by the oxidizing action of ozone. These, of course, are mere speculations insusceptible of proof; but, in the meantime, it must be conceded that the subject opens a new road to experi-

ment and observation, and that very important results may be obtained by following out Schönbein's researches.

[It would be difficult to describe the intense interest which this lecture excited in a large and crowded auditory. The illustrative experiments were most ingeniously contrived, and were remarkable for their novelty. The conclusions of the lecturer were fully justified by the results.

We think Mr. Faraday has afforded the right explanation in assigning the properties of ozone to an allotropic condition of oxygen. This extraordinary element, which forms by weight one-fifth of the atmosphere, eight-ninths of water, and one-half of the solid crust of the earth, may, like other supposed elements, be capable of existing in two states (allotropic) so widely differing from each other as to possess nothing in common excepting the name. Phosphorus presents this allotropic condition: in its ordinary state it is colourless, luminous in air in the dark, forming a deliquescent acid, is soluble in bisulphuret of carbon, and melts and burns at a very low temperature, about 108°. If phosphorus be kept for a time at a temperature between 464° and 482°, its properties are entirely changed: it acquires a brownish-red colour on cooling; it requires a high temperature for combustion: so that, unlike common phosphorus, it may be safely handled and carried in the pocket: it does not deliquesce in moist air, and is quite insoluble in bisulphuret of carbon. Liebig states that, while common phosphorus is poisonous, the altered phosphorus has no action on dogs. At a low red heat, the altered phosphorus is reconverted to and reacquires all the properties of ordinary phosphorus! There is, therefore, no apparent change of matter, but merely a change of state.

Thus Mr. Faraday considers that oxygen bears the same relation to ozone that ordinary does to altered phosphorus,—that they may, under certain conditions, pass and repass into each other: but what those conditions are which produce and *regulate* the conversion of oxygen into ozone in the atmosphere it is impossible to say. Chemical agency, electricity, and magnetism, may be the constant sources of production. Decay, disease, and death, affecting alike animals and plants, may be the means by which ozone or allotropic oxygen is consumed; but what power is it that *regulates* the quantity produced, and so adjusts it that it shall conduce to health and life? This is a profound mystery. It is obvious from what is already known, that by an over-conversion of oxygen in the atmosphere into this allotropic condition, every living being would perish; and it is not improbable that the arterialization of blood may be due, not to oxygen in its ordinary, but in its allotropic state. It is commonly said that oxygen is absorbed as such, and the red corpuscles of blood are regarded as oxygen-carriers; but the researches of Schönbein open a new path of research for physiologists.

It has been a mystery whence those sulphates and nitrates are derived, which are frequently found in freshly collected rain water that has only washed the atmosphere. Ozone may be the agent by which the sulphur-gases and ammonia that are diffused in the atmosphere become oxidized and transformed to acids and salts. Acid springs, which are found in some parts of the world, and the great nitre beds of Ceylon, and on the coast of Peru, may owe their origin to this allotropic influence in past ages, and still working slowly at the present time. Although ozone does not appear to be dissolved by water, it is a question whether the oxygen in that liquid may not assume an ozonic condition, and thus account for the rapid conversion of nitrogen, sulphur, and phosphorus, or the compounds containing them, to nitrates, sulphates, and phosphates. Every chemist knows the rapidity with which sulphuretted hydrogen is decomposed in all kinds of water exposed to air:—sulphur is precipitated, or, if a base be present, acidified, and a salt formed. Oxygen, therefore, either in its ordinary or allotropic state, is the great purifier of air and water.

Oxygen in combination may be frequently in the ozonic state, or may become so during its evolution. Chromic acid not only bleaches, but sets free iodine from iodide of potassium. Peroxide of hydrogen and other hyperoxides have a similar action. Chlorine and bromine resemble ozone in their bleaching powers, and in their action on iodide of potassium. The bleaching is commonly referred to *nascent* oxygen, because dry chlorine has no such effect; but for the term nascent

we may now, perhaps, be justified in substituting the word *allotropic*, and refer the effects to the ozonic condition of oxygen.

The oxidation of the metallic sulphurets by ozone throws a curious light on the probable cause of the destruction of photographic drawings. If any sulphuret of silver be left in the finished drawing, the drawing is slowly bleached, and the sulphuret converted into sulphate of silver. In drawings which have been framed the change is observed to commence on the external margin, and slowly spread to the centre. There are many other remarkable chemical changes which will now probably receive a more satisfactory explanation than has been hitherto assigned to them.—Ed. Gaz.]—*Med. Gazette, June* 20, 1851, *p.* 1091.

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# A SYNOPSIS,

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THE FOREGOING PAGES OF THIS VOLUME; AND SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE LAST HALF-YEAR. (ARRANGED ALPHABETICALLY.)

## DISEASES AFFECTING THE SYSTEM GENERALLY.

Dropsy.—In a case of general anasarca, with ascites, after all other remedies had failed, the patient was cured by the following liniment being applied three times a day to one half the surface of the body:—℞. Volatile liniment, two parts; tincture of cantharides, tincture of colchicum, tincture of digitalis, tincture of iodine, of each one part. The patient recovered in a few days. (Mr. W. W. Finch, *London Journal of Medicine, August*, 1851, *p.* 726.)

Fever, *Continued.*—Quinine seems to be very valuable in this disease. It has been given from the apparent analogy of the continued fever of this country with that of tropical climates. Thirty grains of the disulphate have been given in three doses, and the next day the patient has been found with a cessation of the pain of the head and the delirium; the abdomen less tender; the heat of the skin diminished; and the tongue clean and moist. Mr. Eddowes, of the Liverpool Fever Hospital, has given it also in doses of five grains every three hours, and says that, the day but one after its administration, the patient is generally found better; the petechiæ gradually fade, and the fever leaves its unhappy victim. (Dr. Robert Dundas, p. 24.)

*Hay Fever.*—From the nature of the mucous membrane, pertaining something of the analogy between its pathological condition and that of the skin in certain forms of prurigo, arsenic was tried, in five minim doses of Fowler's solution, three times a day. In six days nearly every vestige of the complaint had disappeared. The cases of hay fever chiefly benefited by arsenic are of a catarrhal rather than of an asthmatic character. Five drops may be given of the solution three times a day. Dr. Fowler recommends the following rules for its administration:—Patients, from 2 to 4 years old, may take two to four drops of the solution; from 5 to 7 years, may take from five to seven drops; from 8 to 12 years, may take from seven to ten drops; from 13 to 18, may take from ten to twelve drops; and from 18 and upwards, may take twelve drops as a dose. If the medicine fails to do good, it may then be alternated with quinine, or they may be given concurrently. (Dr. F. W. Mackenzie, p. 27.)

Gout.—The distinguishing points between rheumatism and gout, are, in the latter, the age of the patient; his diathesis; his habitual use of malt liquor; the rapid or sudden way in which the attacks come on; and the fact, that the parts first affected were the small joints, especially the metatarso-phalangeal joint of the great toe and the tarsal joints. In rheumatism, there is always a great tendency to sweat, and the ancles and knees are generally first attacked. As to the heart affection in rheumatism, there is a proneness to fibrinous concretions on the pericar-

dium or endocardium. In gout, the nutrition of the muscular structure suffers, and inorganic deposits (lithate of soda, phosphate, and carbonate of lime) take place in the chordæ tendineæ, and other parts of the fibrous tissue of the heart, ultimately impairing the efficiency of the valvular apparatus. An active antiphlogistic treatment creates asthenia, and this gives a shifting character to both diseases, perilous to both, but especially so to gout. By moderate purgation, the use of diaphoretics, by keeping the joints warm, and if the urine be very acid, by the administration of alkalies, we may to some extent expedite convalescence, and undoubtedly relieve pain. Counter-irritation, by means of a small blister, is of decided utility in many cases, both in relieving pain and removing the effusions or thickenings which remain in gouty joints. Colchicum holds a curious relation to gout, sometimes for good, sometimes for evil; in the majority of cases perhaps the latter. In sthenic cases, in young subjects, it relieves pain, but though it shortens the duration of the attack, it likewise shortens the interval between the attacks; and, as the system is very tolerant of the remedy, there is great danger of immense doses being ultimately required to produce a decided effect. (Dr. R. B. Todd, *Med. Gazette, September* 12, 1851, *p.* 441.)

The chief remedies in some cases, under Dr. Todd, were the use of opium, free counter-irritation over the epigastric region by mustard and turpentine, and the exhibition of the sesquicarbonate of ammonia, allowing three or four grains in excess. The opium may be given in the form of morphia, at bedtime, in a draught. It has been tried with the combination of the acetic extract of colchicum, but this seems to depress. When the erysipelatous state is at its height, fifteen minims of the chloric ether may be added to the dose of the sesquicarbonate of ammonia as a grateful stimulant. Lemon juice is a valuable remedy, increasing the quantity of urine often in a very marked way. (Dr. R. B. Todd, *Med. Gazette, October* 3, 1851, *p.* 565.)

Glanders, *Acute.*—In a case of this kind, a concentrated form of the sesquicarbonate of ammonia was given. From its beneficial effects in severe affections of the throat, which are met with in malignant scarlet fever, two drachms of the carbonate of ammonia are dissolved in five ounces of water; the patient to take two teaspoonfuls every two, three, or four hours, according to the urgency of the symptoms. It may be administered in erysipelas, rubeola, scarlatina, urticaria, roseola, and erythema, with all their varieties. (Dr. F. W. Mackenzie, p. 44.)

Phosphate and Oxalate of Lime.—In all chronic diseases which are distinguished by wasting, emaciation, ulcerations of the skin, &c., (as scrofula, especially rickets, &c.), a much larger quantity of phosphates is removed from the economy by the urine than ought to be in the normal state; indeed, in some cases, to an almost incredible extent. The phosphates of lime and magnesia are held in solution in the urine by its acidity, and directly precipitated by the addition of alkalies, or when the urine becomes ammoniacal by putrescence. This precipitation is more complete by heating or boiling the urine, and by adding a solution of soda to boiling urine the whole may be precipitated; and by always using the same solution of carbonate of soda, say, one to twelve ounces of distilled water, the degrees of turbidity may be readily recognised, and the quantity of phosphates ascertained. There is scarcely any disease in which at one time or another an increase in the quantity of phosphates does not take place; but as the times are quite uncertain, there is necessity for almost daily examination. The increase, however, does not depend so much upon the nature of the disease as upon the individual affected. (Dr. Beneke, p. 310.)

Scarlatina, *Delirium and Coma of.*—In a case of scarlatina, with these symptoms, colchicum was given in the following form:—℞. Sp. æth. nit. 3iij.; pot. acet. 3ij.; tinct. colchici ʒss.; aquæ ʒiiij.; M. ft. A teaspoonful to be taken every four hours. The coma and delirium disappeared on the following day. Before the administration of the colchicum the urine was free from deposit, but subsequently a much larger quantity was passed, and loaded with a deposit of urate of ammonia. (Professor Bennett, p. 31.)

Scrofula.—We should try to prevent it. 1st. Where a taint exists in the mother, the state of health during the period of utero-gestation, should be regarded with the most anxious care. 2nd. As soon as the child is born prophylactic measures should be resorted to during the earlier periods of life. 3rd. If no predis-

position exists, localities or other external agents appearing as the sources of the disease, must be obviated. Nothing tends to produce a feeble frame of body so much as protracted nursing. Dr. Paris recommends strongly, milk impregnated with the fatty matter of mutton suet. (Dr. Shapter, p. 38.)

The best application for a scrofulous sore is certainly the iodide of lead ointment. The hyd. bichloride may be given in doses of from 1-16th to 1-20th of a grain dissolved in distilled water, or in the form of pill, with the ext. of sarsa, twice or thrice a day. In cachectic, chlorotic, and other cases attended by a languid circulation and much general debility, barium may be used as follows.—℞. Baryta chlorid. gr. x.; tinct. ferri mur. 3ij. to ʒss.; syr. aurantii ʒss.; aq. dest. ʒx. Mix; of this ʒss. to ʒj. may be given two or three times a day. Cod-liver oil has little or no influence in the great majority of glandular tumours; but in some forms it is a potent remedy, as when associated with caries of the bones or phthisis. Phosphoric acid, as a medicine, is also most valuable. It may be given in the infusion of calumbo, beginning with five grains of the dilute acid of the pharmacopœia, gradually increasing it to twenty or more. (Mr. T. Balman, p. 40.)

Small-Pox.—As the pitting depends on a sloughing of the cellular tissue from the confinement of the water in the pock, puncture each pustule, and apply a poultice over the whole surface of the face. As the pustules are liable to form on the tongue, fauces, pharynx, and larynx, apply a few leeches over these regions externally, so as to diminish the circulation and to reduce the size of the pocks. (Mr. J. G. Pasquin, p. 42.)

## AFFECTIONS OF THE NERVOUS SYSTEM.

Collapse.—To arouse the vital energies of the human frame, in cases of cholera, suspended animation, and other causes of apparent sinking from threatening collapse, apply scorching hot pillows placed along the spine every ten minutes. (Mr. Haynes, *Lancet*, *September* 6, 1851, *p.* 224.)

Chorea.—In three cases arising from fear, no initial morbid state being present, Dr. Gassier applied chloroform frictions along the course of the vertebral column, by a liniment of chloroform and oil of sweet almonds, in equal parts, with complete success. (Dr. Gassier, p. 65.)

Convulsive Diseases.—Secure a pure atmosphere and a free exposure to the sun in the treatment of convulsive affections. Let the diet be generous; a moderate use of stimulants, as wine and ale, is essential, and, in a few cases, have seemed alone to ward off the attack. Gentle exercise only should be allowed. There is a great mass of evidence against bleeding, and no proof can be found that certain benefit has resulted from the practice. As to purgatives, unless there be a loaded state of the bowels, there is no reason for the employment of purgative remedies in the treatment of convulsive maladies. (Dr. C. B. Radcliffe, p. 58.)

Headache, *Intermittent.*—In intermittent headaches, brow ague, cephalalgia, and other affections in which the mucous membrane of the frontal sinuses appears to be the seat of pain, arsenic has proved efficacious. (Dr. F. W. Mackenzie, p. 30.)

Hypochondriasis.—Most cases of this disease arise in invalids from intertropical climates, from their giving up an accustomed stimulus, this stimulant being heat. To supply the place of this, the use of the vapour bath is a highly important agent. (Dr. Pidduck, *Lancet*, *June* 21, 1851, *p.* 670.)

Paralysis.—Brucine may be given in much larger doses than strychnine, and is therefore more manageable. At the dose of from ten to fifteen centigrammes, slight jerks and prickings are felt in the limbs. There is no cephalalgia or disorder of the mind produced. (M. Bricheteau, p. 64.)

*Cerebral and Spinal.*—In cases of paralysis, where the muscles of the affected limb contract under a less degree of the galvanic influence than the sound limb; and, on the contrary, where the muscles of the sound limb are more sensitive than those of the affected side: in these cases respectively, the influence of the brain or that of the spinal marrow is intercepted. The removal of the influence of the brain conduces, within certain limits, to a comparative irritability of the muscular fibre, whilst the reverse is obtained when the influence of the spinal marrow is taken off. (Dr. Marshall Hall, p. 62.)

Periosteal Disease.—This disease often affects the upper end of the humerus, and the lower end of the femur, and is often overlooked. The shoulder is aching, tender, and cannot be used on account of the pain, the muscles being inserted into the periosteum. The pain is more severe at night; there is no perceptible swelling. There soon follows a state of permanent congestion, or subacute inflammation. The hip joint is liable to a similar affection, but is more rare. In these cases the iodide of potassa must be given three times a day. If of long standing, blisters or issues must be employed. The nitric acid issue is the best. A piece of lint is to be applied the size required, not too wet with the acid, to the tender part anterior to the joint, as it is generally under the covering of the deltoid and biceps, near the joint. It should then be covered over with a piece of lint, dipped in a solution of carbonate of soda. A linseed poultice should be then applied. The slough usually comes away in five or seven days, and the discharge will continue till the pain is removed. (Dr. R. H. Goolden, p. 57.)

*Affecting the Dura Mater.*—The usual cases in the tropics are those who have taken large quantities of mercury for fevers or hepatic disease, having been afterwards exposed to damp in our cold and more northern latitudes. When the perieranium is the seat of the disease, it is at once recognized by the presence of great tenderness, as well as unevenness to the touch; but when the dura mater is affected, this morbid condition is not so palpable. In this case, the patients are often free from pain during the day, but at eight or nine o'clock at night the pain sets in, and is so agonizing that they are willing to submit to any measures to obtain relief. It lasts until three or four o'clock in the morning, followed by a profuse perspiration, when the patient gets some sleep. A blister to the head, opium at night, and iodide of potassium and sarsaparilla during the day, with a good nutritious diet, have dissipated all the symptoms. (Dr. R. H. Goolden, p. 54.

Sciatica.—In sciatica and neuralgia, associated with anemia, give cod-liver oil. (Dr. T. Thompson, p. 84.)

Sulphates *as Signs of Disease.*—The increase of sulphates and phosphates in inflammation of the brain is an evidence of the increased oxidation of the nervous structures. The amount of sulphur in the brain being nearly the same as the amount of phosphorus, at one time we have evident increase of the oxidation of nervous, and at another of muscular tissues: at one time the functions of the nerves, and at another, those of the muscles, being inordinately increased. (Dr. H. B. Jones, p. 65.)

Tetanus.—Use frictions of chloroform all over the body. Recovery was thus brought on in a case in four days. (M. Morisseau, p. 67.)

Mr. Campbell, surgeon of the 55th regiment, says he thinks the Worrara poison has been proposed justly as a last resort in tetanus, by inserting the poison in the finger, and tying a ligature above the wound, so as to regulate its action and effect in the system. (*Lancet, July* 5, 1851, p. 4.)

*Traumatic.*—In a case under Mr. Cock, that gentleman pursued the tonic plan of treatment. Three grains of disulphate of quina were given every fourth hour, and twelve ounces of wine allowed per day. Recovery gradually took place. (Mr. E. Cock, p. 66.)

In the Hôtel Dieu of Marseilles, a case of tetanus from wound of the toes was arrested by large doses of disulphate of quinine, maximum forty-five grains in one day. The cure was completed in about a fortnight. (M. Coste, p. 67.)

Professor Miller records three successful cases of traumatic tetanus from the use of Indian hemp. (p. 318.)

Toothache.—The most intense toothache connected with decayed teeth is relieved in a moment by the magic touch of the membrana tympani with a blunt probe. Agonising neuralgia of the face is relieved in the same way. These effects are supposed to be obtained by the influence of the chorda tympani nerve. (M. Desterne, *Lancet, June* 7, 1851, p. 636.)

## AFFECTIONS OF THE CIRCULATORY ORGANS.

CARDIAC INFLAMMATION.—If exceedingly sudden and formidable, as from rheumatism, bleed from the arm boldly, and follow up with opium and mercury as well as colchicum. If the attack has been foreseen, smaller amounts of blood, locally abstracted, may serve the same purpose. If necessary this may be followed by a blister and belladonna plaster, while mercury and antimony are exhibited with a small amount of opium. Then give colchicum cautiously to convert the uric acid into urea: to accomplish this, it need produce none of its usual physiological effects. Nitrate of potassa and phosphate of soda may also be given, and if acidity is suspected in the lower bowels, magnesia may be given. Irritability or pain is to be subdued by hyoscyamus, digitalis, aconite, or conium. (Dr. Nelson, *Prov. Med. and Surgical Journal, July* 9, 1851, p. 365.)

NÆVUS.—In a case of nævus of the anterior fontanelle, Mr. Erichsen made a puncture about the eighth of an inch above the tumour, and an eyed probe conveying whipcord was pushed across the base of the mass. He then cut down upon its point when it projected below the tumour, and then drew it across; the transverse threads having been carried through in a similar manner, the knots were tied in the usual way, and the mass firmly and effectually strangulated. The child having been under the influence of chloroform, suffered no pain. The threads and sloughing mass separated in three days, leaving a healthy granulating surface, which speedily cicatrized. (Mr. J. Erichsen, p. 197.)

In another case Mr. Erichsen proceeded rather differently. A long triangular needle was threaded on the middle of a whipcord about three yards in length, one half of this was stained black with ink, and the other half was left uncoloured. The needle was now entered through a fold of the sound skin, about a quarter of an inch from one end of the tumour and transversely to the axis of the same. It is then carried through until a double tail nine inches in length was left hanging from the point at which it entered, it was next carried across the base of the tumour, entering and passing out beyond its natural limits, so as to leave a series of double loops at least nine inches in length on each side. Every one of these loops should be made about three quarters of an inch apart including that space of the tumour, and the last loop should be brought out through a fold of healthy integuments beyond the tumour. In this way we have a series of double loops one white and the other black, on each side. All the white loops should now be cut up on one side, and the black loops on the other, leaving hanging ends of thread of corresponding colours. The ordinary double ligature, or quadruple thread as used and figured by Mr. Liston, always includes a circular mass, and hence is not applicable to these growths that are much elongated or irregular in shape. (Mr. J. Erichsen, p. 197.)

*Cellulo-Venous.*—In this case a crucial incision was made through the integuments covering the tumour, and reflecting these to its base, a large mass was exposed apparently composed of much dilated and tortuous veins and cellular tissue, with a few cysts containing brownish fluid. Nævus needles were pushed across the base of this, and it was strangulated with strong whipcord. (Dr. J. Erichsen, p. 198.)

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## AFFECTIONS OF THE RESPIRATORY ORGANS.

ASTHMA.—*Thymic.*—Apply leeches occasionally on the upper part of the chest, and iodine externally and internally; pay strict attention to every source of irritation with a view to its immediate removal, causing the child to lie with its head well raised during sleep. Select light food and a healthy atmosphere. *Diagnosis:*—Dr. Copland says male children are chiefly liable to it; pale, white, soft countenance; permanent fulness about the upper part of the sternum, extending upwards nearly to the thyroidal region; an almost constant fulness of the veins of the neck, particularly after any effort, dulness on percussion over that part of the sternum. Signs of congestion of the lungs, and from an early period, difficulty of swallowing; the crowing sound is either entirely absent or only partial, the pulse is weak and intermittent, and there are copious perspirations over the head. (Dr. J. Armstrong, p. 92.)

Cod-Liver Oil.—Combine liq. potassæ with the cod-liver oil, especially in the early stage of phthisis. Where cod-liver oil cannot be administered internally, it may be rubbed into the chest, night and morning, combined with a little oil of lavender. If diarrhœa be produced, one ounce and a half of cod-liver oil, four drops of creasote, two drachms of compound tragacanth powder, and four and a half drachms of aniseed water, form a suitable mixture, of which an ounce may be taken thrice daily. If vomiting is produced, the addition of creasote often makes the stomach more tolerant of the remedy. The taste of the oil may be covered by eating dried orange peel, or by introducing a little dinner salt into the mouth before or after taking the oil. (Dr. T. Thompson, p. 80.)

Expectoration *as a Means of Diagnosis.*—If a person with some severe chest complaint coughs frequently, and expectorates only frothy, salivary-looking fluid, we suspect pleurisy; if a glairy fluid like the white of egg, we suspect bronchitis; if it has a rusty tinge, and resembles gum water coloured with blood, we are likely to find pneumonia. If there is a sudden gush of pus in considerable quantity, we expect to find that matter accumulated in the cavity of the pleura has found its way into the bronchial tubes. In consumption the expectoration assumes four characters: 1st, salivary or frothy; 2nd, mucous; 3rd, flocculent; 4th, purulent or porraceous. The 1st may proceed from irritation or slight tubercular deposit. The 2nd may proceed from a more confirmed affection of the bronchial tubes. The 3rd is peculiarly characteristic of secretion from a vomica modified by the absorption of its thinner constituents; and the 4th is indicative of phthisis far advanced, and (if unmixed with froth) usually involving both lungs. The black matter often expectorated is not carbon, as commonly supposed; it is rather a pigment known to be formed under slight or not severe forms of bronchial inflammation. On a little heat being applied to this expectoration, and the microscope used, crystals of apparently triple phosphate may be seen, the proportion of the salts being in an inverse ratio to the degree of inflammation present. The 3rd form of expectoration mentioned above, viz., the flocculent, is stated to be almost a pathognomonic symptom of phthisis. When spat into water it assumes the form of globular masses, like little balls of wool or cotton. Some of these masses have subsided, some are suspended at different depths, others float on the surface, sustained by bubbles of air, entangled in the surrounding mucus. If the process of contraction is going on in a vomica, a diminished quantity of expectoration is a favourable symptom. This is promoted by the use of appropriate regimen, the administration of cod-liver oil, and by the inhalation of turpentine. When the bronchial tubes contribute much to the supply, the skin being moist and the appetite defective, naphtha may sometimes be useful, but generally speaking, tannic acid will probably be found a more appropriate remedy. (Dr. T. Thompson, p. 78.)

Hæmoptysis.—Bronchial tubes readily ulcerate; thus expectoration from cavities is promoted. In arresting hemorrhage from the lungs, undue haste should be deprecated. As a general rule, it is better to produce determination to other organs, than to employ direct astringents. Give a dose of calomel, or mercurial pill with henbane, followed by the use of half-drachm doses of sulphate of magnesia with diluted sulphuric acid administered twice a day, or antimony, with nitrate of potash. If the hæmoptysis is passive, alum is the best of the astringents to be used, as the following:—B. P. gum arabic, p. sacch. alb. aā 3ij; p. tragacanth, 3iss; alum 3ij; g. catechu, 3ij; aquæ rosæ, q. s., to form a mass to make sixty lozenges. Gallic acid is not so prompt and effectual as the acetate of lead, but suits some cases remarkably well. (Dr. T. Thompson, p. 76.)

Hooping Cough.—Give Fowler's arsenical solution. Previous to and during its use, bleeding, blisters, and emetics may be employed according to the indications. Children of a year old may take it safely. In catarrh or influenza, it may also be given, in the following form. R. Liq. pot. arsenitis 3j; vini ant. tart., vini ipecac., liq. potas. aā 3iiss; aquæ distil. aa ℥xij., Fiat mistura cujus sumatur ℥j ter die. (Dr. F. W. Mackenzie, p. 29.)

Laryngitis.—Apply the solution of the nitrate of silver. This may be of two strengths, as occasion may require, ℈ij. or 3j. of the crystallized salt to the ℥j. of distilled water. The mode is as follows: Two instruments are necessary; a tongue depresser, with a bent handle, and a piece of whalebone, ten inches long,

at the end of which must be fastened a piece of the finest sponge, the size of a pistol bullet. Expose the patient seated in a chair, to a strong light, depressing the tongue with the depressor held in the left hand. Holding the probang in the right hand, the sponge having been saturated in the solution, pass it carefully over the upper surface of the instrument, exactly in the medium plane, until it is above or immediately behind the epiglottis. Desire the patient now to inspire, and as he does so drag the tongue slightly forwards with the depressor, and thrust the probang downwards and forwards, by a movement which causes you to elevate the right arm and bring the hand almost in contact with the patient's face. (Professor Bennett, p. 100.)

PHTHISIS, *Diagnosis of.*—Observe if there is a streak of vermilion tint, inclining to form on the reflected edge of the gums, most distinct around the lower incisors. The absence of this streak in men affected with inconclusive symptoms of phthisis may incline us to a favourable interpretation of any suspicious indications; but in woman rather less weight is to be attributed to this negative sign. The presence of this sign in women, is almost conclusive evidence of the presence of the tubercular element in the blood. Those cases, in which the streak is observed early, or is broad or deep coloured, tend to proceed more rapidly than those in which it is absent or slight, whilst freedom from the streak, even in the third stage, affords encouragement for treatment. (Dr. T. Thompson, p. 75.)

PNEUMONIA.—In an early case, before exudation is poured out, and before dulness as its physical sign is characterised, bleeding will often cut the disease short. But if there is perfect dulness over the lung, increased vocal resonance, and rusty sputum, then exudation blocks up the air-cells, and can only be got rid of by that exudation being transformed into pus, and excreted by the natural passages. (Professor Bennett, p. 90.)

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## AFFECTIONS OF THE DIGESTIVE ORGANS.

ACETATE OF LEAD.—Never give the acetate of lead but in a fluid form, or without acetic acid being combined with it, and rarely without Battley's liq. opii sedativ. (Dr. R. Burridge, p. 116.)

CHEEK, *Fistulous Opening in.*—In a case of this kind, a platinum wire, heated by electricity, was passed through the fistulous opening so as to produce a slough. This caused little pain, and ultimately produced a cure of the disease. (Mr. J. Marshall, p. 204.)

CHOLERA, *Asiatic.*—Give one grain of acetate of lead every ten minutes. (Mr. W. Sweeting, p. 114.)

DENTAL PULP, *Destruction of.*—For a description of apparatus for the destruction of the dental pulp by the platinum wire heated by electricity, see pages 202 and 203. (Mr. G. Waite and Mr. T. H. Harding.)

DIABETES.—The benefit derived from the use of cod-liver oil in this disease is often remarkable. (Dr. T. Thompson, p. 83.)

DIARRHŒA.—The advantages in diarrhœa of creasote are that it often succeeds when other astringents fail—it is speedy in its action, and it does not leave the bowels constipated, unless carried too far in its administration. The dose for children from one to two years old, is the one-eighth, one-sixth, or one-fourth of a grain. With adults, the dose, as an astringent, is from one and a half to two minims. (Mr. B. W. Richardson, p. 111.)

DIARRHŒA, *Autumnal.*—Give the citrate of iron and quinine, especially when the affection assumes an intermittent type. (Dr. James Bird, p. 110.)

DYSENTERY.—Give an enema of the acetate of lead in the following form:—Acetate of lead six grains; pure water one oz.; laudanum from thirty to fifty drops: mix for an enema. This should be given and repeated according to the frequency of the discharges, and retained as long as possible. (Dr. J. P. Batchelder, p. 111.)

FISTULA.—To cure fistula without operation, insert into the wound a copper probe of the requisite length, dipped into dilute nitric acid, (one part acid to one of water). The application should be made every day. Copper probes are used on account of the destruction of the silver ones by the strength of the acid. (Mr. H. B. Evans, p. 211.)

GASTRALGIA.—In cases of true gastralgia, disconnected with any inflammatory complication, use the following formula:—℞. Subnitrate of bismuth, ten grammes; extract of belladonna, one gramme; make forty pills: two to be taken night and morning. (Prof. Caizergues, p. 109.)

HEMORRHOIDS.—If external, and palliative treatment does not avail, excise them. If internal, let a lavement of half a pint of cold spring water be thrown into the rectum every morning after breakfast. As an aperient, use the lenitive electuary, or the bitartrate of potash, at bedtime. If these fail, remove them. A dose of castor oil should be given eight hours before the operation, and a pint of warm water should be thrown up shortly before the surgeon's arrival. It is well to bear in mind that retention of urine is sometimes the result of operations upon internal piles. This must be removed by introducing the catheter. (Mr. T. B. Curling, p. 217.)

INTESTINAL OBSTRUCTION.—In cases of obstruction of the intestines within the abdomen, the following are the indications to pursue:—1st, to open the bowels; 2nd, to subdue the inflammatory action; 3rd, to support the strength; 4th, to remove the obstruction. (Mr. R. R. Robinson, p. 205.)

LEAD COLIC.—Give on the first day five centigrammes of the extract of belladonna, with ten centigrammes of the powder of the root. If this is without effect, the second dose is ten centigrammes of the extract with twenty of the powder. (M. Malherbe, p. 116.)

PORTAL OBSTRUCTION.—When urine contains purpurine, or presents other appearances of portal obstruction, the diuretics, or other remedies employed, should be preceded or accompanied by the administration of mild mercurials, taraxacum, hydrochlorate of ammonia, or other cholitic remedies. (Dr. G. Bird, p. 155.)

RECTUM, *Fissure of.*—Give chloroform, and divide the fissure by a longitudinal incision through the centre of the ulcer, including the sphincter muscle. The great source of mischief is now set at rest, and the ulcer heals; but the healing process is promoted by applying a plug of lint, coated with the following application;—Liq. plumb. diacet. 3j; confect. rosæ ʒj. This plug, dipped in sweet oil, is to be applied to the part. In sensitive ulcers of the rectum, and in painful affections generally, apply the following ointment:—Chloroformyli 3j. to 3ij; zinci oxydi 3ss; olei olivæ 3j; cerat. cetacei 3iv. M. ft. ung. (Mr. T. B. Curling, p. 215.)

*Prolapsus of.*—In a case under the cases of Mr. Fergusson, in which the prolapsed part was the size of a man's fist, that gentleman operated by taking up portions of the redundant skin, surrounding it with the volsellum, and cutting off five triangular pieces, with the base towards the anal orifice. The bowel was then returned, the parts well supported, and dressed with wet lint. (Prof. Fergusson, p. 214.)

*Ulcer of.*—In a case of a small ulcerated fissure of the rectum, such fibres of the sphincter muscle were divided with a sharp-pointed bistoury as prevented the finger being readily introduced. This treatment was followed with success. Another remedy proposed by Dr. James Arnott, is to pass a bougie made of common yellow soap up the rectum from time to time. (Mr. H. Smith, p. 215.)

TÆNIA.—Give a drachm of oil of male fern first thing in the morning, followed in an hour afterwards by an ounce of castor oil. (Mr. W. Cowen, p. 116.)

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## AFFECTIONS OF THE URINARY ORGANS.

ALBUMINURIA.—The presence of pus in the urine may obscure the diagnosis in this disease. The pus corpuscles float in a fluid containing albumen; it thus becomes mixed with the urine and renders it albuminous. A good test for pus is the addition of liq. potassæ, by which it is converted into a mucous fluid, and when poured from a vessel exhibits its glairy character. We must endeavour to obtain the urine free from pus, and if the urine then ceases to be albuminous, it is evident it has no connection with Bright's disease, and vice versa. If, then, albumen exists in the urine independently of pus and blood, and if we have excluded puer-

peral fever, gestation, and cholera, as possible causes, we may conclude the patient to be subject to one of the forms of Bright's disease. Now, as owing to the drain of albumen, there is an excess of water in the blood, we must endeavour to render the specific gravity as nearly proper as possible. To promote this, experience has decided upon the use of hydragogue cathartics, vapour baths, and iron. Iron should not be given in the active stages of the disease. As regards the use of iron in anemia generally, we are advised to persevere with its use, notwithstanding the frequent complaints of the patient that it does not agree with him. Abstract then the excess of water from the blood by saline purges, and persevere in introducing iron into the system. (Dr. G. Owen Rees, p. 136.)

Bright's Disease.—Ascertain whether the coagulability of the urine present depends on albumen, by the aid of heat first, and then by the addition of nitric acid. All intercurrent diseases are more unmanageable, and more apt to prove fatal, in consequence of the renal disorder. The most mortal of all signs are, a very scanty urine of very low density, an extremely impoverished condition of the blood corpuscles, and stupor gradually verging towards coma. The treatment of Bright's disease is two-fold; to remove the fundamental disease, and to cure the secondary diseases. The main remedies for the former object are general and topical depletion, local counter-irritation, diaphoretics, diuretics, and astringents. The best diuretics are digitalis, squill, and bitartrate of potash, but when all these have failed diuresis has been established by Hollands. The cathartic plan should not be adopted for the dropsy, it is apt to excite a permanent diarrhœa, and mercury should be shunned as inducing in this disease excessive action. The best remedy for the diarrhœa is the Edinburgh lead and opium pill, in a dose of five or ten grains, twice or three times a day, to which may be added, in severe cases, a fatty suppository of morphia. Vomiting may be removed sometimes by bismuth, more frequently by morphia, hydrocyanic acid, creasote, chloroform, or little fragments of ice; when these fail, by a blister applied over the epigastrium. (Prof. Christison, p. 142.)

Hæmaturia.—Dr. Rees mentions two forms of hæmaturia; the one produced by calculus in the kidney, and the other by malignant disease. The same remarks made with regard to alkaline urine from irritation of the mucous membranes, may be applied to the presence of a calculus in the kidney. Our object must be to render the urine as unirritating to the mucous membrane as may be, and enable that membrane thus to bear the presence of the calculus with as little inconvenience as possible. To relieve the spasm of the canal, we should combine alkaline and demulcent remedies with such sedatives as the patient can bear without injury to the stomach. The best styptic is perhaps tannic acid; it should be given in the form of pill, at intervals between the doses of iron, in doses of from four to eight grains three times a day. It should not be given in solution, on account of its being rapidly converted in the stomach into gallic acid. (Dr. G. Owen Rees, p. 132.)

Hydrocele.—Mr. Bransby Cooper says that since he has employed injections with the tinctura iodinii composita, he has had no occasion to resort to other means. It has succeeded where other remedies had failed, and he has observed no ill effects accrue from its use. (Mr. B. B. Cooper, p. 243.)

Phosphatic Diathesis.—To remedy that state of the system which gives rise to the excretion of the phosphates, producing secreted alkaline urine, the mineral acids seem to be the most valuable means we possess of restoring the stomach to its healthy function. If we add liquor potassæ to urine in a state of full acid reaction ammonia is immediately evolved. Test paper now used proves the urine to be alkaline, and the disappearance of the blue colour produced on the litmus by exposure, proves it at once to be the volatile alkali ammonia, the fixed alkali being neutralized by the acids with which the ammonia was previously combined. So in inflamed mucous membranes the alkali of the mucus is a fixed one; but this alkali gradually neutralizes the acids combined with the ammonia in the urine, and thus ammoniacal urine is produced. If the fixed alkali is more than sufficient to neutralize the acids of the urine, then the litmus paper becomes permanently blue. We should always ascertain then whether turmeric paper or litmus paper is affected permanently or not. In these considerations we must exclude that form of alkaline urine which is secreted alkaline, and characteristic of dyspepsia. The distinction

between the two kinds is, that urine secreted alkaline is very rarely accompanied with more than the normal amount of mucus; while that made alkaline by the action of the mucous membranes always contains an abnormal quantity of mucus and epithelium, and very often pus also. In the case of alkalinity arising from irritated mucous surfaces, we must direct our treatment to them. In this case, opposite to that of the other, we must exhibit alkalies. The urine as it is secreted must be rendered alkaline, and so less irritating; at the same time attending to the secretions generally, especially to that of the skin. The best means to fulfil the former indication are by exhibiting the salts of vegetable acids as the citrate of soda or potassa, especially when it is not desirable to risk purging the patient; but if we wish to produce such effect, then the tartrate of potassa may be combined or used separately; indeed, for this purpose, there is no better remedy than the seidlitz powder of the shops. The old remedy, liq. potassæ, is likewise one of the most valuable for the purpose of producing an alkaline state of the urine. We are likewise assisted in our endeavours to relieve the irritation of the mucous surfaces by the digestion of all subacid fruits. (Dr. G. Owen Rees, p. 121.)

Dr. Beneke found the phosphates to be present in the urine in very different and nearly all sorts of diseases, varying on different days in one case, and always remaining of nearly the same amount in others; proving that it is not the disease itself which causes the excretion of phosphates, but that there must necessarily exist some other cause in the economy to account for the excretion alluded to. In all cases of rapid emaciation there was a large excretion of the phosphates, and sores of blisters in these cases scarcely healed at all, or not until long after. We may provide persons in this condition with the largest quantities of albumen and fat, but we shall never produce thereby a remarkable increase of tissues or complexion—that is to say, of formation of cells, if we do not diminish at once the excretion of phosphates by the urine. A hypernormal excretion of earthy phosphates by the urine is independent of the nature of the disease. When we observe such an excretion, we find a corresponding deficiency of formation of cells, emaciation, and loss of strength; but this deficiency is not always exclusively caused by a hypernormal loss of phosphates, it is often only the result of fever or suppuration, or of any other loss of material necessary for the regeneration of tissues and organs. It is to be observed we shall never be able to judge of the quantity of the earthy phosphates present in an ounce of urine, unless we examine the whole quantity which is passed during the twenty-four hours. Although albumen and fat are present, the phosphate of lime increases the produce of cells, and in this manner we may promote the cure of diseases showing a deficiency of formation of cells, especially in scrofula. On the other hand, in all wasting diseases, a hypernormal quantity of phosphates is always excreted, especially in those cases where the phosphate of lime proves most beneficial. This quantity, from Dr. Beneke's investigations, is not increased by the administration of the phosphate of lime, but on the contrary, by its use the quantity in the urine often decreases considerably. (Dr. Beneke, p. 312.)

*Phosphatic Calculi.*—Inject the nitro-saccharate of lead into the bladder for the purpose of decomposing the calculi. This salt may be obtained from Mr. Garden, of Oxford-street. One grain of the salt, superacidulated with five drops of strong acetic acid, is then to be mixed with ℥j. of water, and the whole brought to the boiling point. From four to eight ounces of the solution may be thrown into the bladder at once, by means of a double-current caoutchouc catheter, and renewed in ten or fifteen minutes, as may be deemed proper. Exercise increases its effect. If slight revulsion be produced wait a day or two, and then renew the injection. (Dr. J. Elliott Hoskins, p. 240.)

Spermatorrhœa and Impotence.—Let the patient sit in the hip-bath of Priessnitz for five minutes three times a day, the water being brought to the temperature of 65°. The time may be increased and the temperature lowered, until the patient sits for twenty minutes, three times a day, in water at 50°. In some cases the spine may be sponged for three or four minutes before leaving the bath. A shower-bath may be used after the first daily sitting-bath, the head being protected by a conical cap. (p. 248.)

Stricture of the Urethra.—For some admirable conclusions with regard to strictures in general, and their treatment, by Mr. G. J. Guthrie, see page 227.

The treatment of stricture resolves itself into—1st. Dilatation. 2nd. The application of caustic. 3rd. Division of the stricture, either from within, by the lancetted catheter, or from without, by perineal incision. Dilatation is the simplest and best. As a general rule, the more gently and gradually dilatation is effected, the more permanent will be the relief afforded. In the majority of strictures, and when of long standing, silver catheters, or steel sounds plated, of a proper length and curvature, especially the latter, from their having more solidity than the former, are the best dilating instruments. In cases of retention of urine, where there has been considerable difficulty in introducing the catheter, it should be retained, if practicable, for a period of from twenty-four to forty-eight hours. If dilatation does not succeed in such cases, caustic has been proposed, and successfully employed by many surgeons of high character. Before we apply the potassa fusa, we ought to be able to pass a bougie into the bladder of at least a size larger than the finest kind, to enable us to apply the caustic to the whole surface of the stricture, and likewise to put it in our power to remove a suppression of urine should it occur during the use of the caustic. Caustic potass is superior to nitrate of silver. It may be applied advantageously for two purposes—one to allay irritation, the other to destroy the thickened tissue which forms the obstruction. The bougie should be marked as directed by Mr. Whateley; and if the points of the caustic be covered with lard, there need be no fear of its acting before it reaches the stricture. (Mr. R. Wade, p. 233.)

Mr. Milton recommends a new plan to caustic bougies. The part of the bougie where the caustic is to be placed is first made flat, then a little rough. The caustic is then fused on a sixpence, and the rough spot on the bougie dipped in it, when it is instantly and smoothly coated with caustic. It is then dipped in tallow, and twirled round until this sets, so that over the caustic there is a smooth sheath of fat. (Mr. J. L. Milton, p. 233.)

Twisted bougies have been recommended in stricture of the urethra, as being better adapted to follow the sinuosities of the stricture, than the plain ones. (M. Leroy d'Etioles, p. 238.)

URINE, *Serum of the Blood in.*—One means to detect the presence of the other constituents of the blood without albumen in the urine is, by adding the tincture of galls, which precipitates one of the extractive matters. The extractives of the urine possess this property in only a slight degree. In albuminous urine the albumen may be first separated, and the test then applied. Dr. Rees arrived at the following results:—That albumen was always accompanied by a large proportion of the extractives of the blood; that these cases were generally marked by debility; that the extractives of the blood were excreted in the urine in cases of anasarca with disease of the heart, unconnected with albuminuria; that cases of chlorotic anemia and hysteria give copious precipitates; that deficiency of albumen was accompanied by deficiency of blood extractives; and that the proportion of the blood extractives diminished by the use of ferruginous tonics. It is to be remembered, that the urine of those in almost perfect health often shows traces of the presence of the extractives of the blood; and that the precipitate above mentioned is that which *immediately* follows the addition of the tincture of galls, as in a short time a considerable precipitate of the salts is thrown down. (Dr. G. Owen Rees, p. 139.)

VARICOCELE.—In one case Mr. Fergusson passed three needles under the scrotal veins, and twisted strong silk round them, as in the hare-lip operation. After a few days the needles were removed, which were very nearly out, and in five days afterwards the sores were rapidly healing, and the patient was soon discharged cured. (Prof. Fergusson, p. 242.)

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## AFFECTIONS OF THE SKIN, &c.

CICATRIZATION.—M. Grusell has lately intimated to the French Academy of Sciences, that charpie suspended in a decoction of oak bark for some days and then dried, forms an admirable dressing after the excision of cancerous tumours, as it preserves the simple condition of the wound, and obtains rapid cicatrization. (*London Journal of Med., July*, 1851, *p.* 669.)

Efflorescence *of the Face.*—In cases of red spots, or efflorescence of the face, wash them in a solution of borax, two parts to 15 parts each of orange flower and rose waters. (M. Vanoye, p. 258.)

Erysipelas.—In the common forms of erysipelas, give fifteen drops of the muriated tincture of iron, every three hours. It may be especially given in cases of infantile erysipelas, in doses of two drops, as well as in that form of erysipelas dependent upon internal injury. From the analogous nature of puerperal fever to erysipelas, many valuable lives might be preserved, in the opinion of the author, by its bold and persevering use. (Mr. G. Hamilton Bell, p. 252.)

Iodide of Potassium.—The iodide of potassium was shown by the late Dr. Robert Williams to be of great certainty in rupia and hard periosteal node; that its power is much less in roseola, purpura, and ecthyma, but still it is better than mercury; while, in lichen, lepra, psoriasis, and iritis, mercury is more beneficial than the iodide. If suppuration has commenced in the node, then sarsaparilla is the remedy, the iodide being useless. In soft node and prurigo, he shewed the true power of sarsaparilla; and in syphilitic angina and rupia, the invariable good effects of combining local mercurial applications with the internal administration of the iodide of potassium. (p. 268.)

Lepra Vulgaris.—The common galium aparine seems to be a valuable remedy for this disease. It is commonly known by the name of cleavers or goose-grass, and grows abundantly in the hedges of this country. A decoction of the plant may be made by boiling a large handful of the plant in a quart of water for about twenty minutes. Of this decoction three parts may be taken daily. (Dr. J. M. Winn, p. 259.)

Lupus.—Apply the bi-ioduret of mercury, incorporated with ointment, or suspended in oil. Only a small space should be done at once, as it requires reapplying for five or six days. In three or four days the application forms a crust with the exudation it occasions, and on falling off displays a small cicatrix. (M. Cazenave, p. 259.)

Psoriasis, *Chronic.*—In squamous diseases of the skin, M. Cazenave prescribes ten parts of ammonia to 250 of simple syrup, the patient taking from six to twenty-four grains of the salt daily. (p. 259.)

Sycosis.—Amongst the most useful applications are the citrine ointment, the iodide of sulphur, and the tar ointment. At the same time give Fowler's solution (Mr. E. Wilson, p. 258.)

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## AFFECTIONS OF THE BONES AND JOINTS, &c.

Ankle-Joint, *Amputation at the.*—One reason, Mr. Fergusson says, why surgeons refuse to perform amputation at the ankle-joint is, that the integuments are often swollen and ulcerated. But this is no objection to the proceeding, the disease being produced entirely by, and kept up by, the irritation of the carious bone, a principle of the greatest importance to be remembered. Sloughing of the lower flap has been often observed, and in order to obviate this, Mr. Syme has recommended a shorter flap to be made; and Mr. Fergusson states that he has even made a shorter one than that recommended by that gentleman. It is desirable to make the flap no longer than is absolutely necessary. (Professor Fergusson, p. 185.)

Bursæ Mucosæ, *Deep Vaginal.*—In the treatment of tumours of these synovial sacs, the plans recommended for their cure have been extirpation; incision, either simple or combined with irritation of the surface of the cyst; subcutaneous puncture; and iodine injections. Mr. Coulson has generally contented himself with incising the tumour longitudinally, and evacuating the contents. Some amount of inflammation ensues, with obliteration of the cavity, but sometimes the inflammation proves very severe, inducing great constitutional disturbance, and in some cases even death has ensued from the attack. (Mr. W. Coulson, p. 172.)

Elbow-Joint, *Disease of.*—Mr. Gay has treated cases of disease of the joints by making one or two incisions right down to the diseased joint, with a view of letting out the debris of the diseased articulation, the remnants of cartilages, &c.,

which seem to him one of the principal obstacles to the procuring of anchylosis. (Mr. J. Gay, p. 171.)

Hip-Joint, *Hysterical Affections of.*—The vegetable tonics seem to be more efficacious than the metallic. But when the appetite is tolerably good, the tongue clean, the bowels regular, then the metallic tonics may be employed with good effect. In most neuralgic affections the preparations of iron are valuable, none more so than the carbonate. To relieve pain no remedy is preferable to valerian. Dr. Copland says the remedy he has found most useful is the spirit of turpentine, prescribed in various modes, internally and externally, and administered in enemata; the preparations of iodine alone, or with narcotics and camphor. (Mr. W. Coulson, p. 167.)

Knee-Joint, *Internal Derangement of.*—Place the patient upon a sofa on the opposite side to the affected knee, then take hold of the ankle with the right hand, and by slow and gentle means, gradually flex the limb. And then when the patient is off his guard, suddenly and powerfully perform the full extension of the limb. When the full extension is accomplished, the cure is usually complete. If this does not succeed, place the arm under the popliteal space to act as a fulcrum, to separate, as far as may be, the head of the tibia from the condyles of the femur, and at the same time produce rotation of the tibia. In all cases of contraction of muscles, place the origins and insertions of the muscles as far apart as possible. The masseter muscle sometimes becomes contracted, and may be relieved by the gentle insertion of a wedge into the cheek. (Mr. S. Smith, p. 162.)

## VENEREAL AFFECTIONS.

Balanitis, *or Gonorrhœa Preputialis.*—In the uncomplicated disease wash the parts dry, then carefully, and by means of dry lint, accurately placed between the glans and prepuce, separate the two surfaces. If the parts are slightly inflamed, whiten the parts by simply passing a stick of caustic over them. The parts should then be washed daily with a lotion of zinc and tannin, one grain of each to the ounce, then dried, and lint applied as before. If phimosis be present and be irremediable, the operation of circumcision must be performed. Mr. Acton describes his method of performing the operation at page 269. (Mr. W. Acton)

Blennorrhagia *of the Vulva.*—Enforce cleanliness. A soothing plan should be first employed, and separation of the surfaces attempted; then lotions of nitrate of silver, 3j. to ℥ij. of distilled water, with the addition of warm baths. If the inflammation has gained the deeper structures, leeches may be employed in addition, to the groins; and if abscess should form, it must be opened immediately, though we should pause when the inflammation occurs round an already-formed cyst. (Mr. W. Acton, *London Journal of Medicine, July*, 1851, *p.* 651.)

Bubo.—Give one grain doses of tartar emetic every second hour, until a marked effect is produced upon the inflammatory swelling. (Mr. J. L. Milton, p. 268.)

Chancre.—If caustic is applied soon after the receipt of the virus it may be entirely destroyed, as within three days the disease is entirely local. Before employing the nitrate of silver, the part should be perfectly cleansed, by soaking it in warm water, so as to wash off the virus from the surrounding parts, lest a re-inoculation should take place. The parts are then to be dried, and if any slight fisures or excoriations are found, the parts may be stretched, and a stick of the caustic just passed over them, so as to whiten them. If they are at the orifice of the prepuce, the prepuce should be drawn gently back, and then the part cauterized; and in the next application, if necessary, care must be taken not to break the previous cicatrix. To aid the caustic, a tannin lotion may be used, two grains to ℥j. of water; but as this lotion slightly stains the linen with a brown mark, which may tell tales to the family, a sulphate of zinc lotion may sometimes be used. As a rule, the sore may be re-cauterized in twenty-four hours. If a pustule has formed, nitrate of silver is not strong enough. The pus must be evacuated, and then a layer of Vienna paste inserted, or the solid lime and caustic potash laid on. If a scab has formed, it must be removed by a poultice, and then the Vienna paste applied, extending a little beyond the edges. The sore, after the eschar falls

off, is not specific, and heals in a few days under a mild astringent wash. We must bear in mind that when there is acute inflammation around the chancre, escharotics must not be used. (Mr. W. Acton, p. 263.)

*Phagedænic Chancre.*—Give iron. M. Acton trusts chiefly in the tartrate, probably any other form would do as well. If there is sloughing phagedæna, give opium in large doses. Destroying the surface of the ulcer with nitric acid is useful in some cases. (Mr. W. Acton, p. 265.)

CHORDEE.—To relieve this condition no remedy is so efficacious as camphor. It may be given in the form of the spirit of camphor, in doses of 3j. in a small quantity of water. The best plan is for a teaspoonful to be taken at bedtime; and every time the patient awakes with the chordee, let him arise at once and repeat the dose. (Mr. J. L. Milton, p. 271.)

GLEET.—A blister applied to the penis will often cure the most prolonged gleet. Two blisters and mild injections have cured a clap which had resisted the most energetic treatment. If uncomplicated, it should be applied from the root to within half an inch of the mouth of the urethra; in milder cases one hour and a half. If there are any vesicated spots they must be covered with pieces of linen spread with zinc ointment. Brown's blistering tissue is preferable to the common blistering plaster. In severe cases a longer application is necessary. To protect the penis from a friction, a T bandage must applied, with a bag to receive the penis, and thus to keep it up against the abdomen if necessary. In common cases, a soda and jalap powder may be taken twice a day, and a zinc injection used, 3j. to Oj. (Mr. J. L. Milton, p. 272.)

Examine the passage by a wax bougie, No. 6 or 8. If an irritable surface is detected, use the strong caustic injection, and give copaiba or cubebs; following up by injections of zinc and tannic acid. If incipient stricture be detected, the nitrate of silver is not advisable; but bougies should be passed every other day, astringent injections being used in the intervals. (Mr. W. Acton, p. 269.)

GONORRHŒA.—In the early stages of gonorrhœa, before the acute symptoms have passed, after the patient has made water, inject into the urethra a solution of nitrate of silver; ten grains to the ounce, and keep it in contact with the mucous membrane a few seconds. The patient must then sit down for ten minutes, and withstand the desire of making water, which, for a short time, is very violent. The effects as to the discharge are generally almost immediate, and the redness produced on the urethra commonly disappears in a few days. A suspensory bandage is then applied under the testes, and rest and abstinence from any fluid enforced for a few hours, so as to give the urethra a little repose. Sometimes a second or even a third injection is required; but commonly a cure is effected in a few days. This treatment should only be adopted in the earliest stage. (Mr. W. Acton, p 260.)

Ricord frequently prescribes the following as an injection to be used two or three times daily; and it is obviously applicable as a lotion to other cases. Take of tannin and sulphate of zinc, each one gramme; rose water two hundred grammes. If the sulphate of zinc be perfectly pure, the solution will be colourless; but if (as is generally the case) it contain some oxide of iron, it will be of a deep red hue, from the formation of a tannate of the oxide of iron, which, being a good astringent, does not injure the lotion. (*London Journal of Medicine, August*, 1851, *p.* 750.)

Use an injection of the solution of diacetate of lead, 3ij. to six ounces of distilled water. Another is a solution of alum, four grains to the ounce. Another an infusion of green tea, a drachm to half a pint. By ringing the changes on these, perhaps, all the good effects of injections may be obtained. (Mr. Johnson, p. 260.)

NON-SPECIFIC AFFECTIONS.—These, which consist of *warts, vegetations, herpes preputialis, eczema, and excoriations*, may be treated with strong acetic acid. Mr. Acton recommends the powder of oxide of zinc in the more simple forms, and in the obstinate a powder composed of equal parts of ærugo and pulvis sabinæ. (Mr. W. Acton, *London Journal of Medicine, July*, 1851, *p.* 653.)

SYPHILIS.—Mr. Acton gives an admirable description of chancre at page 263. Concerning the original production of the syphilitic poison, Mr. Acton is of opinion that it arose from some poison introduced into the economy from animals,

and that thus produced, it has been transmitted from one individual to another. (Mr. W. Acton, p. 263.)

If a strong alcoholic solution of soap, having an excess of alkali, be applied to a sore, within five minutes after the inoculation with the poison of chancre, the effects of the virus will entirely disappear. (Dr. Langlebert, p. 262.)

Syphilitic Cutaneous Eruptions.—In rhe treatment of these eruptions, which may come on as exanthematous affections, vesicular, papular, tubercular, pustular, and as ulcerations, Mr. Acton strongly recommends mercurial fumigations. He fully describes his method at page 267. He does not believe the condylomata to be inoculable. As local treatment he recommends the parts to be washed with a solution of chloride of soda twice a day, the parts to be well dried, and calomel sprinkled upon them, and dry lint kept between the excoriated surfaces. (Mr. W. Acton, p. 266.)

## AFFECTIONS OF THE EYE AND EAR.

Deafness.—For a description of the cure of cases of deafness, by the employment of vibratory or musical sounds, by Dr. Turnbull, see page 252.

Epiphora.—Slit up the lachrymal canal from the punctum on the conjunctival aspect, so as to carry backwards the orifice at which the tears are received on to the mucous membrane near the carbuncle. In cases of obstruction from injury, the sac may be slit up for some way so as to receive the tears at a new opening. (Mr. W. Bowman, p. 251.)

Iris, *Hernia of.*—A solution of five grains of atrophine in an ounce of distilled water was applied to the prolapsed iris of the injured eye, but with little result; but by applying it to both eyes the method succeeded at once. (Mr. Morehouse, p. 251.)

## MIDWIFERY, AND THE DISEASES OF WOMEN.

Amenorrhœa.—In a stubborn case where the catamenia had never appeared, with constant severe uterine and lumbar pains, the key-tsi-sing was given, and after thirteen doses the discharge was ample, first of a brown sandy colour, afterwards a free florid healthy discharge. (Dr. John Cocker, *Med. Times, July* 5, 1851, *p.* 22.)

In anemia, depending on amenorrhœa, the general characters of the blood are very similar to those met with in cases of anemia arising from other causes. Loss of blood from any cause appears to lead to the same morbid condition of that fluid as the defective secretion or elimination of certain principles which ought to be separated from it. This latter condition is always fulfilled in amenorrhœa, which disease is by far the most frequent cause of anemia in girls about the age of twenty; and it appears the more remarkable, when the great similarity of composition of ordinary blood and of the menstrual secretion is taken into consideration. So that the same alteration in the constituents of the blood may be brought about by loss of blood, as in menorrhagia, or by the opposite condition of amenorrhœa, or suppressed menstruation. In these cases, the amount of water is usually much increased, and the quantity of solid matter proportionately diminished. (Mr. H. Smith and Mr. L. S. Beale, *Medical Times, June* 7, 1851, *p.* 619.)

*Chlorotic Amenorrhœa.*—Employ the galvanic cataplasms of Professor Recamier, which may be obtained of Mr. Buckler, 86, New Bond Street, Oxford Street, at the cost of 15s. They are described as follows:—"Each of these cataplasms, or disks, if a scientific term be preferred, is a galvanic pile composed of twelve couples. The couple is formed by a ribbon of zinc and copper, and each couple is separated by a piece of flannel. On the coloured side is cotton wool; on the other, a piece of gutta percha tissue to insulate the apparatus. The only difference between the two disks is, that, in the pink one, the copper stands first, while the zinc comes first in the one covered with blue. The electrical force generated in the apparatus is sent through the copper rings, to which the insulated copper wire can be attached when the more energetic effect of the two cataplasms is

required. In some people the acid perspiration of the skin is sufficient to increase the intensity of the electric action; but more active effects are produced by wetting the flannels with diluted vinegar, or a weak solution of common salt, as is seen by the action of the apparatus on the electrometer. When one of these cataplasms is tightly bound to the surface of the skin, it gives an unusual sensation of warmth,—a pricking sensation is felt, and the skin is made red; and, when two of the cataplasms are connected by the arm, and applied to the same surface, but at some distance from one another. A stronger effect is produced when one is applied to the organ we wish to influence, and another to the opposite portion of the spine. Such are the modes of application; and it may be worn day and night without inconvenience, though, in ordinary cases, it is only under application at night." (Dr. Tilt, *Med. Gazette, June* 13, 1851, *p.* 1044.)

Chlorosis.—In those tedious cases where a girl eats hearty, takes plenty of sleep and exercise, has nothing on her mind, yet still deriving but little benefit from good food and judicious treatment, Professor Recamier recommends his galvanic poultices; one of the disks being applied to the epigastric region, the other to the spine. See "*Chlorotic Amenorrhœa.*" (Dr. Tilt, *Med. Gazette, Jun.* 13, 1851, *p.* 1044.)

Indian Hemp, *as an Oxytocic.*—This seems to be a valuable oxytocic remedy. Several cases are given by Dr. Christison illustrative of its powerful effects. The extract may be given in the form of pill, but in this form the hemp is rather uncertain. Another form recommended is the emulsion, made by rubbing a scruple of the extract in a warm mortar in a drachm of olive oil, to which may be added half an ounce of mucilage, and seven and a half ounces of distilled water. The tincture is perhaps the best form, of the strength of three grains of the extract to a drachm of rectified spirit. The dose of the extract is from one to six grains, of the tincture ten to thirty drops. To promote uterine contraction, less than thirty drops is of little service. In tetanus one or two drachms must be given. (Dr. Alexander Christison, p. 320.)

Inversion *of the Uterus.*—Drs. Denman, Burns, and Merriman advise the uterus with the attached placenta to be returned; but the latter mentions an instance in which he first detached the placenta, and the patient did well. (Dr. Merriman, p. 278.)

Menstruation, *Cessation of.*—To those who are advanced in years, the following may be given at bed-time:—Guaiacum resin, cream of tartar, each half a drachm; or, Dr. Paris' form for the 'Chelsea Pensioner:'—Guaiacum resin, 3j.; powdered rhubarb, 3ij.; cream of tartar and flowers of sulphur, each ℥j.; one nutmeg finely powdered, and the whole made into an electuary with one pound of clarified honey. A large spoonful to be taken at night. (Dr. E. J. Tilt, p. 299.)

Premature Labour, *Induction of.*—Dr. Simpson recommends the dilatation of the os uteri by sponge tents, gradually increasing them in size. The membranes are also separated to a certain extent. This he had never found to fail, although he had employed it in numerous cases. In this manner the first stage of the labour is almost entirely accomplished before labour begins, and consequently, the child is saved from the pressure, &c., incidental to the earlier and protracted part of the first stage. (Professor Simpson, *Monthly Journal of Med. Science, July,* 1851, *p.* 88.)

Puerperal Fever.—Any fluid matter in a state of putrefaction, communicated by linen, a sponge, small particles of placenta, or by the ambient atmosphere, may induce puerperal fever. To remove such matter from the hands, wash them in a solution of chloride of lime. (Dr. Semmelweiss, p. 292.)

Puerperal Insanity.—The most appropriate treatment to be adopted is, that which we should employ for anemia, and as the condition of the blood becomes impaired the cerebral disorder will disappear. (Dr. F. W. Mackenzie, p. 286.)

Sterility.—In those cases which cannot be accounted for by any disease, but which seem to depend on defective ovarian action, apply Professor Recamier's galvanic poultices. See "*Chlorotic Amenorrhœa.*" (Professor Recamier, *Med. Gazette, June* 13, *p.* 1044.)

Tumour, *Sanguineous Pelvic.*—This form is met with between the uterus and rectum, displacing the uterus frequently, so that the fundus may be felt above the

pubes. The treatment is to evacuate the liquid by means of a large trocar; afterwards enlarging the opening by means of a lithotome, and removing any clots which may be in a state of commencing putrefaction. (M. Nelaton, p. 297.)

Polypus Uteri.—For a new instrument for the purpose of removing uterine polypi by the combined influence of pressure and caustic, invented by Dr. O'Grady, see page 300.

Uterine Hemorrhage.—In a most dangerous case of this nature, five grains of acetate of lead were given every hour for forty-eight hours. As the hemorrhage returned on the suspension of the medicine, the same dose was given every four hours, and continued for a fortnight with complete recovery; the patient having taken in sixteen consecutive days 576 grains. (Mr. W. Sweeting, p. 114.)

Indian hemp is exceedingly valuable in restraining uterine hemorrhage. The tincture of the hemp is the most efficacious preparation; it may be given in doses of five to fifteen or twenty minims three times a day in water. (Dr. Christison, p. 321.)

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## MISCELLANEA.

Anæsthetic, *New.*—This agent, which Dr. Snow has been recently using with great success, and which he believes had not been administered before, is the chloruretted hydrochloric ether. "The substance is called by its discoverer, M. V. Regnault, *l'éther hydrochlorique monochloruré*. It is the first of a series of five bodies which he formed by decomposing muriatic ether by means of chlorine gas in the sunshine. A liquid which is a mixture of these bodies, has been used for some months in Paris by M. Aran, a very zealous experimentalist, as a local application to relieve and prevent pain. Dr. Snow having procured a quantity of this through the kindness of Mr. Morson, chemist, of London, separated the first and more volatile of the liquids by distillation, and he thinks that it possesses some advantages over chloroform." (*Lancet, June* 28, 1851, *p.* 698.)

Aperient, *Mild.*—The employment of the cortex of the rhamnus frangula, or alder buckthorn, has been recommended by Dr. Gumprecht, of Hamburgh, as a valuable and cheap substitute for some of the aperients now in use. "The fresh cortex is not to be used, as being uncertain or violent in its effects, that which has been kept at least a year being preferable. If given in infusion it sometimes causes vomiting, and the decoction has been found the best and simplest way of preparing it, although the tincture and watery extract are very efficient preparations. The decoction may be prepared with ℥ss to ℥i. of the cortex to ℥xii. of water, boiled down to ℥vj., the strength depending upon the condition of the patient, duration of the disease, &c. So, too, the dose of a tablespoonful may be given every two or three hours, or two or three times a day, according to the state of the bowels and system in general. (*Med. Times, Nov.* 1, 1851, *p.* 469.)

Bite *from an Adder.*—In a case in the General Hospital, Birmingham, the parts were excised, and the surface cauterised by a strong solution of ammonia. Dry cupping was afterwards resorted to, and the parts well smeared with olive oil. The pain and swelling still continuing, he was ordered sesquicarbonate of ammonia 3iss; decoction of cinchona, ℥viij., ℥j. every half hour. A tablespoonful of brandy to be taken every ten minutes; a mustard cataplasm was applied to the abdomen, followed by fomentations of camomile and poppies. The patient recovered. (*Lancet, Aug.* 19, 1851, *p.* 137.)

Grease *in Man, Inoculation of.*—In a case in Guy's Hospital, three grains of quinine were ordered three times a day; also a lotion of nitrate of silver, 3ss. to ℥j. of distilled water, applied by a sponge pushed up the nostrils; with full diet, ten ounces of port wine, and two pints of porter daily. The solution of caustic seemed decidedly to have killed the disease. The parts around the nose, cheeks, and eyes, were much swollen, and were punctured. The streams and jets which flowed from the wounds showed the state of congestion the parts were in. (Mr. Cock, *Lancet, Aug.* 9, 1851, *p.* 179.)

Medicines, *to Disguise the Taste of.*—We should prepare the mouth before instead of after swallowing nauseous medicines, in order that their taste may not

be perceived; aromatic substances chewed just before, as orange or lemon peel, &c., effectually prevent castor oil being tasted. (Dr. Polli, *Med. Times, Aug. 5.* 1851, *p.* 160.)

Tannin, *Employment of.*—Dr. Cummings states, as the result of several years' experience, that he has found tannin the most valuable of *astringents.* Thus, whenever, in dysentery, medicines of this class are indicated, it acts admirably, either given alone or combined with opium. He says, he could refer to more than a thousand cases of dysentery, diarrhœa, cholera infantum, &c., in which he has employed it, never with regret, and almost always with advantage; while other practitioners, with whom he has communicated concerning it, express similar opinions. In the sweating, or last stage of phthisis, or low continued typhus, and even in the worst cases, this accompaniment of diseases of debility has been entirely or in part relieved. It is useful in almost all forms of hemorrhage, and most remarkably so in hemoptysis; and when combined with opium and ipecac, it forms a medicament very preferable to acetate of lead and other similar substances. Among other forms of hemorrhage, over which it exerts great power, is that from the bowels resulting from dysentery, and that which occurs in threatened abortion. In hemorrhoids, it is of great use as an outward wash. In epistaxis, it may be snuffed up or blown through a quill, and will almost always arrest the bleeding. No article in the whole class of astringents acts like it in severe salivation. In aphthæ and other diseases of the mouth, in which there are spongy or bleeding gums, it possesses no equal. Used as a gargle in relaxed uvula and tonsils, its efficacy is great. As an *antiseptic*, for cleaning old foul ulcers, the author has extensively used it in the form of a powder, especially when there is disposition to hemorrhage. As an astringent collyrium, it is, in his opinion, preferable to all other substances in the purulent ophthalmia of infants. He administers it internally in two-grain doses. (*Boston Med. Journal; and Brit. and For. Medico-Chirurgical Review, Oct.* 1851, *p.* 556.)

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It contains all the valuable medicinal properties of Opium in natural combination, to the exclusion of all its noxious, deleterious, and useless principles upon which its bad effects depend. It possesses all the sedative, anodyne, and antispasmodic powers of Opium.

To produce sleep and composure.

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To allay convulsive and spasmodic actions, &c., &c.

And being purified from all the noxious and deleterious elements, its operation is attended by

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Nor any derangement of the constitution or general health.

Hence its high superiority over Laudanum, Paregoric, Black Drop, Denarcotized Laudanum, and every other Opiate preparation.

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The following testimonial, recently received, embraces several interesting and very important facts connected with the administration of the Elixir of Opium; and it is believed that the views expressed by Dr. Webb will accord with the experience of every Physician who may adopt the use of this truly valuable remedial agent in his practice:—

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Very respectfully yours, EDWIN WEBB, M.D.

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☞ NOTICE.—A. B. & D. SANDS having purchased of Dr. McMunn all his right, title, and interest in this article, and having been the sole Proprietors since the year 1841, and by whom it has all been prepared during that period, respectfully inform dealers and consumers, that no Elixir of Opium will hereafter be genuine, unless having their signature on the outside wrapper; and all orders from the "Trade" must be addressed, as heretofore, to A. B. & D. Sands, Wholesale Druggists, 100 Fulton-street, corner of William, New York. Sold also by Druggists generally.

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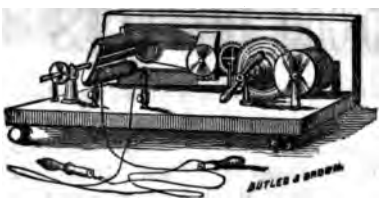

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It may be proper here to say that, during the last eight years we have been daily in the use of instruments of this kind, and find the fact established with us, that if instruments designed for medical use are not constructed with reference to a due relation of quantity and intensity, they are comparatively unfit for medical use, and in many cases will aggravate some forms of nervous irritability, as is the case with the old electrical machines, consisting of the glass cylinder and Leyden jar; and that hard and powerful shocks, except in those cases of paralysis where sensation and motion are both suspended, are never desirable, but rather to be avoided, and that in the majority of cases the benefit desired is not measured by the strength of sensation of the shock, but by the relative degree of quantity in the mechanical construction of the machine, which mere artists cannot know; hence a great proportion of the machines are comparatively worthless that are found in the market; and hence, too, there are many more disappointments in their use than need be, when scientifically constructed for a remedial agent, as well as to sell.

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Our instruments are in use at the New York Hospital; and we refer you to

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In medicating for the human family the Dr. has not overlooked the noblest of all animals—the Horse.

DR. KELLINGER. *Dear Sir.*—My hair continues firm and sleek. I had none when I commenced using the Fluid. Mr. E. Dickson, at Hudson, whom you have already published, had no hair from his seventeenth to his forty-second year. I knew him well. His case, as well as mine, will astonish any one who will make an examination. Yours, truly,

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Mr. John Clarke, of Hastings, had no hair for fifteen years; I saw Mr. C.; it is a most astonishing growth. There were upwards of twenty confirmed cases in Yonkers, who have had their hair renewed.

Yours sincerely, JAMES MILLER.

I am well known to ex-Alderman R. P. Getty, and the Hon. Aaron Vark of Yonkers.

DR. KELLINGER. *Dear Sir.*—In the last five years, among our large number of horses, we have used your truly wonderful Liniment. In the meantime we have been urged to use several new Liniments, having larger bottles, and much larger pretensions, but none of them will compare with yours for healing old sores, cuts, and bruises; it also cures the heaves, and all manner of hard swellings strains, spavin, ringbone, curb splints, thrusts, kicks, and corks. Nearly three years since, one of my men was riding a horse, and leading three. The horse stumbled, and he fell, and was trampled upon in the most awful manner. He was taken up for dead. Your magic remedy was applied, and he walked out the following day. This is only one out of many astonishing cases among my men.

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N.B.—Dr. Kellinger was relating the above to a friend on board the steamer America, on the route to Yonkers. The Hon. Moses H. Grinnell stood in hearing, and made the remark that it was a strong story and seemed to think that it was highly colored; and on the following morning, on his way to the landing, he, and his son, and coachman, were thrown from the carriage. Mr. G. and son were scarcely scratched, but the man was thrown upon his face with a frightful concussion. The following day he received Mr. G. at the landing without a mark to be seen From that time to the present Mr. G. says he has never been without it in his family. It is mild, pleasant, and agreeable in odor and action.

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As a Hair Tonic and Restorative it has never had its equal. There are many pretended remedies for restoring the hair, but not one of them can show a single case of baldness of twenty years' standing having been renewed: this our remedy has done in a number of cases, where the persons were over sixty years of age—of which we can give evidence of an indisputable character. Two or three applications fasten and stop the hair from falling out. It heals all manner of scrofulous ulcers and skin diseases at the bottom, so that they never return. It has a most delightful odor, rendering the air of the sick room agreeable as soon as the bottle is uncorked; and when taken internally leaves the breath pleasant and agreeable. No lady or gentlemen will suffer their toilet to be without it after a trial; it clears, softens, and beautifies the skin, on old or young, and creates a most delightful and cheerful feeling whenever it is used.

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Within five minutes after being thrown into their vicinity.

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President of the Board of Trustees, and late Surgeon U. S. Navy.

BROOKLYN, December 17th, 1851.

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D. AYRES, M.D.,
Surgeon to Brooklyn City Hospital.

BROOKLYN, December 17th, 1851.

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JAMES M. MINOR, M.D.
Surgeon Brooklyn City Hospital, late passed Assistant Surgeon U.S.N.

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☞ D. & H. can also refer to Dr. CHEESMAN and other eminent Surgeons of New York.

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An association has been formed, the object of which is, to make known to the whole public with all diligence, the curative powers of a Composition compounded and prepared by J. B. Marchisi, M.D., a regularly educated Physician and Pharmaceutist, called

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Their knowledge of the superior remedial powers of this Composition is founded upon the truths of Medical Science, and confirmed by the experience of thousands of ladies who have resorted to it with the most happy success.

We justify ourselves in keeping this Composition a secret, on the ground that thereby a greater reward will insure its more general and speedy dissemination, and the sufferers be the sooner relieved. And also, that it requires in its preparation the nicest practical pharmaceutic knowledge; and one half of its remedial effects would be lost if improperly prepared; and to secure its efficiency, we shall retain its composition in our hands.

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We respectfully offer, in support of the alleged merits of the Medicine, the following letter from a Physician of upwards of thirty years' practice, and graduate of the College of Physicians and Surgeons of this city:—

To Dr. Marchisi:—To your request I will reply, that having the composition and mode of preparation of Marchisi's Uterine Catholicon made known to me, I am free to declare that it is made of medicines entirely from the vegetable kingdom, and does not contain any mercury, nor any article unfriendly to the animal economy, and is prepared in accordance with the science of Pharmacy. Being impressed with the belief that this composition is capable of effecting a great amount of good, if properly prepared and taken, and not having the right of publishing the composition without a forfeiture of reposed confidence, I have thought it not incompatible with my relations to my profession, and my duty to society and suffering humanity, to allow my solicited opinion of the powers of this composition, called Dr. Marchisi's Uterine Catholicon, to be published, trusting that nothing but good can grow out of the promulgation of truth. P. B. Peckham, M.D.

Utica, N. Y., July, 1851.

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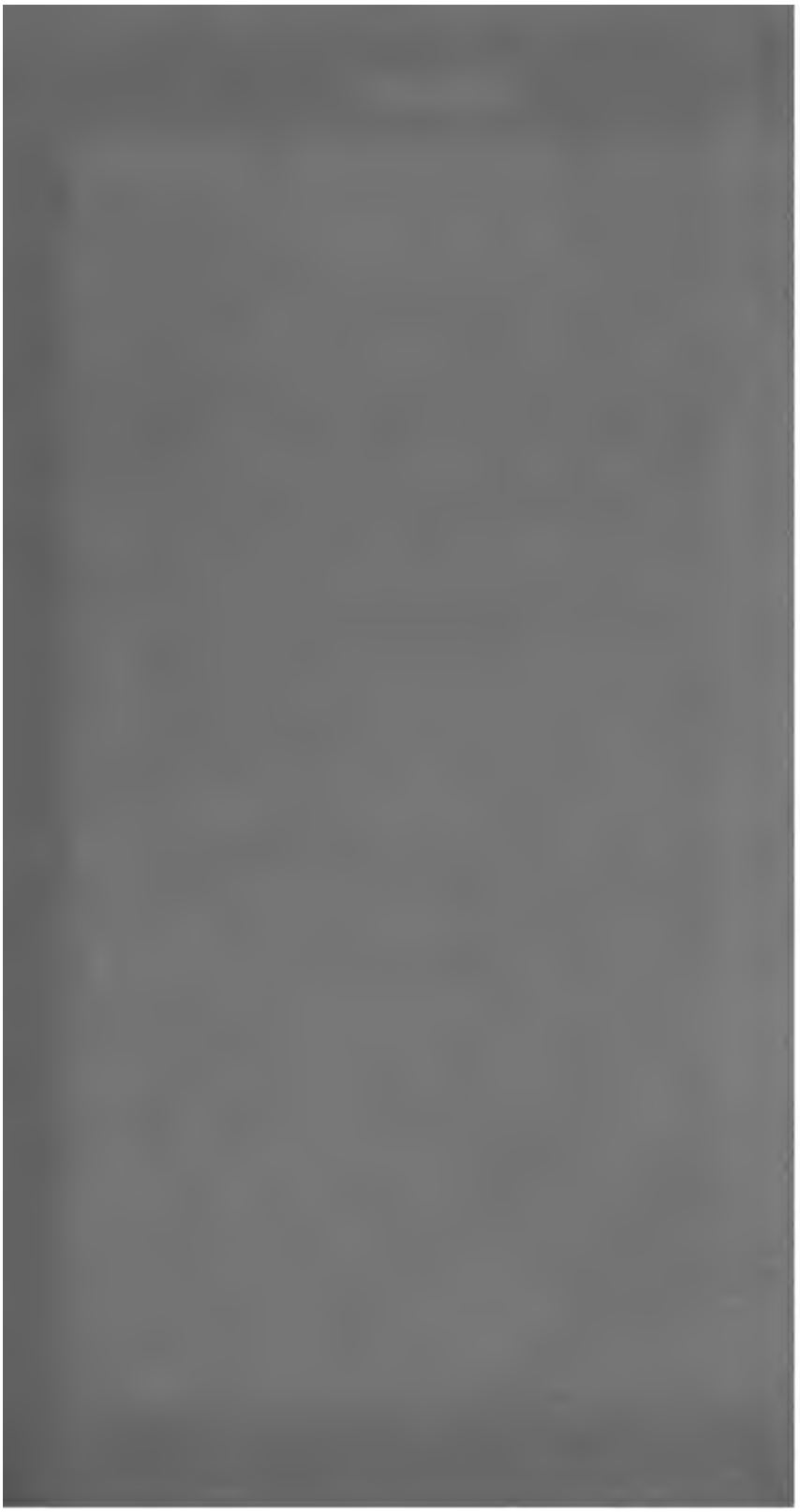
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